

Chapter 16

Socioeconomics, Population, and Housing

16.1 Affected Environment

This section describes socioeconomics, population, and housing characteristics in the primary and extended study areas. For a more in-depth description, see the *Socioeconomics, Population, and Housing Technical Report*.

16.1.1 Socioeconomics

Socioeconomics covers age, race/ethnicity, income/poverty, employment and labor force, business and industry, and government and finance. The data presented in this section reflect conditions that existed before the U.S. recession that began in late 2007 and became apparent beginning in 2008. Changes to the California and U.S. economies attributable to the recession resulted in increases in unemployment rates statewide; therefore, actual unemployment rates in the study area are now generally higher than presented in this section. This section uses the pre-recession figures to reflect economic conditions that were current in 2005, when the notice of intent for the SLWRI was released. Using these earlier figures does not affect the conclusions in the environmental impact analysis presented in this Environmental Impact Statement (except that with a higher unemployment rate, employment generated by project construction could result in a greater benefit to the local economy). For more details, see the *Socioeconomics, Population, and Housing Technical Report*.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Race/Ethnicity In 2005, the white population represented more than 83 percent of the populations of Shasta and Tehama counties, but substantial increases were observed in many minority groups (U.S. Census Bureau 2006a, 2006b). Tehama County's minority populations also increased between 2000 and 2005. Trends observed in the two counties generally coincide with statewide trends, where Hispanic, Asian-Pacific Islander, and American Indian populations all grew by more than approximately 12 percent over the 5-year period.

Income/Poverty Jurisdictions within the primary study area have underperformed when compared to the statewide averages for income levels and poverty rates. Median household incomes in Shasta and Tehama counties were sizably lower than the statewide average in 2000 and 2005, although Shasta County experienced a substantial increase in incomes in the 5-year period. With median household incomes of \$34,520 and \$42,227 in 2004 and 2005,

respectively, Shasta County and Tehama County had incomes averaging between \$11,000 and \$19,000 less than the statewide average for 2005. Overall poverty rates and child poverty rates have also been higher in the primary study area than in California as a whole.

Employment and Labor Force Since 1990, employment rates in both Shasta and Tehama counties have consistently been below the statewide average. Because of the cyclical nature of the area's natural resource-related industries and other factors, Shasta and Tehama counties were characterized by substantially higher unemployment rates during the 1990s (Shasta County 2004). In 2005, Tehama County registered a 7.3 percent unemployment rate, while unemployment in Shasta County totaled 6.9 percent of the population. As a result of its larger population, Shasta County maintained a labor force of just under 83,000 people in 2005, or more than three times that of Tehama County.

Business and Industry Economic activities in the primary study area coincide in many ways with the industrial composition of California as a whole. Trade, transportation, and utilities, followed by governmental services made up the top two industrial sectors both locally and statewide in 2002. In Shasta and Tehama counties, government employees and employees in the trade, transportation, and utilities sectors account for more than 20 percent of the total workforce. Similarly, educational and health services, including teachers and health workers, also ranks in the top five industries in both counties and California generally.

Some differences also exist between the industrial makeup of the two counties and that of California as a whole. For example, manufacturing plays an important role in Tehama County (14.9 percent) and California (11.3 percent) as a whole, but a comparatively small role in Shasta County. Professional and business services registers as the third largest industry at the statewide level (14.6 percent), but represents a smaller portion of employment in Shasta County (9.1 percent) and Tehama County (5.4 percent). Additionally, farm employment makes up a sizeable portion of the total workforce in Tehama County (7.4 percent), but accounts for a comparatively small portion of the workforce in Shasta County (1.6 percent) and California as a whole (2.5 percent).

Projections of future growth depict slightly different economic trends in Shasta and Tehama counties than at the statewide level. California's professional and business industry is expected to grow by almost 30 percent by 2014 (compared to 2004 levels) and the educational and health services industry is expected to grow by more than 25 percent in that time. These industries also represent the top two growth industries in Shasta County, but growth rates are expected to be slightly less in the county (24 percent and 22 percent, respectively).

Established businesses, along with new businesses that locate in the area, will play an important role in the expansion of the local economy projected by the State. Table 1-11 in the *Socioeconomics, Population, and Housing Technical*

Report displays a number of the major employers in the primary study area. This list of employers includes a range of businesses with a payroll of more than 500 people. Three of the nine businesses provide health care to local residents. Other employers include a wholesale distribution center, a wholesale nursery, and a manufacturer of industrial materials.

Government and Finance Shasta and Tehama counties are the critical local governments in the primary study area. Each county has a primary urban center (Redding in Shasta County and Red Bluff in Tehama County), with a limited number of small cities and towns and large amounts of rural land surrounding it. Because the two counties are largely rural, their total revenues and expenditures are relatively low when compared to other jurisdictions in California.

Revenues generated by Shasta County are used for a range of governmental activities. As described in the *Socioeconomics, Population, and Housing Technical Report*, expenditures increased from \$302.8 million in the 2007–2008 fiscal year to \$319.7 million in the 2008–2009 fiscal year. Expenditures decreased substantially in the 2009–2010 fiscal year to \$309.6 million as a result of decreased spending on transportation-related projects. Welfare, social services, and other public assistance has consistently been the largest expenditure for Shasta County (more than \$94.1 million in 2010), but remained relatively constant between 2007 and 2010. Police, fire, and other public safety activities represented the second largest expenditure category with more than \$79.7 million in the 2009–2010 fiscal year.

Observed trends in Tehama County’s revenues and expenditures have been generally similar to those experienced in Shasta County. Because of its smaller size, Tehama County’s total revenues are substantially less than those of Shasta County (\$112.3 million in the 2009–2010 fiscal year, compared to \$309.6 million in Shasta County), but Tehama County experienced an overall decrease in revenue growth between 2007 and 2010.

Expenditures in Tehama County are also consistent with trends observed in Shasta County.

Lower Sacramento River and Delta

Race/Ethnicity Overall, the majority of people in the nine-county lower Sacramento River and Delta portion of the extended study area are white (53.0 percent), but the proportion of population identified as white varies substantially between counties. The white population of Butte County (79.1 percent) in 2005 was the highest proportion of any county in the area, while San Joaquin County had the lowest proportion of white residents (42.9 percent) (DOF 2007a). These proportions are still generally higher than that observed at the statewide level in 2005 (44.4 percent).

Income/Poverty Income and poverty characteristics for the lower Sacramento River and Delta area are similar to those for California as a whole. The median

household income of the majority of counties within the nine-county area is similar to or higher than the statewide median household income (\$53,629).

Poverty levels for both individuals and children in the lower Sacramento River and Delta counties were similar to the statewide level. San Joaquin (14.2 percent), Butte (16.4 percent), and Yolo (17.8 percent) counties had higher overall poverty rates than California as a whole (13.3 percent) in 2006. The percentage of people below the poverty level is expected to follow national and statewide economic trends.

Employment and Labor Force Employment and labor trends in the nine counties of the lower Sacramento River and Delta are generally consistent with statewide trends. The area maintains a labor force of more than 1.9 million people, representing approximately 11 percent of California's labor force (17.7 million).

In the nine-county area in 2005, approximately 5.3 percent of the labor force was classified as unemployed. This unemployment rate compared to a statewide total of 5.4 percent for the same period. Although the total unemployment rate was similar to California's unemployment rate, unemployment within the lower Sacramento River and Delta counties varied substantially. Generally, the counties with the highest unemployment rates in 2005 had greater dependence on the agricultural industry and a reduced industrial diversity. Four of the five counties with unemployment rates above the statewide average maintained more than 60 percent of their land mass in agricultural production (DOF 2007b, 2007c, 2007d, 2007e, 2007f).

Business and Industry Business and industry in the lower Sacramento River and Delta counties is composed primarily of five industries: government; trade, transportation, and utilities; educational and health services; professional and business services; and leisure and hospitality. These five industries consistently rank in the top five industries of the nine counties of the lower Sacramento River and Delta portion of the extended study area.

Government and Finance A total of 55 cities and towns and a range of special districts are located within the nine counties of the lower Sacramento River and Delta. This collection of governmental entities provides valuable public services to the lower Sacramento River and Delta area—education, fire protection, employment development, emergency services, and crime prevention and control. These agencies and special districts rely primarily on tax revenue disbursed by State government, local sales and property taxes and fees, and the disbursement of Federal funds. This greater reliance on existing tax structures and rates, and a productive economic base, makes relatively reliable and affordable CVP and SWP water and power even more valuable, because its availability and affordability helps foster local business activity and thus indirectly helps sustain the fiscal health of local service providers. Similarly, flood protection provided by Shasta Dam helps protect and sustain

the appraised value of property within the dam's floodplain, again helping to protect the fiscal health of local service providers.

Total revenues and expenditures vary substantially between the nine counties of the lower Sacramento River and Delta because of the relative sizes of the counties and the services they provide. Revenues include payments received through taxes, licenses and permits, grants from other governments, charges for services, and others. Expenditures include payments made by a jurisdiction to buy goods, pay its employees, and provide services to its residents. Revenues and expenditures range from the approximately \$65 million budgeted in Glenn County for 2006-2007 to Contra Costa County's approximately \$1.2 billion budget.

CVP/SWP Service Areas

Race/Ethnicity The population within the CVP and SWP service areas continues to diversify. The proportion of the statewide population made up of minority groups has been steadily increasing. Almost all of the minority groups in the CVP and SWP service areas (except Black or African-American) experienced double-digit population growth between 2000 and 2005 (U.S. Census Bureau 2002, 2006b). Hispanics are the largest minority population in California and many members of this ethnic group work on farms that receive some or all of their water from the CVP and SWP.

Income/Poverty Poverty levels for both individuals and children in California decreased slightly between 2000 and 2005. The percentage of people below the poverty level is expected to follow national and statewide economic trends.

Employment and Labor Force Employment and labor force trends observed in the CVP and SWP service areas are generally synonymous with the trends observed at the statewide level because of the expanse of the CVP and SWP service areas. California's total labor force increased consistently from year to year between 2002 and 2005. In each year, California added between 100,000 and 200,000 individuals to the labor force. (As stated previously, the data presented in this section reflect conditions that existed before the U.S. recession that began in late 2007. This section uses the pre-recession figures to reflect economic conditions that were current in 2005, when the notice of intent for the SLWRI was released.)

Increases in California's total labor force have been relatively consistent; the statewide unemployment rate has fluctuated slightly since 2000. California's unemployment rate was lowest in 2000 (5.0 percent) and increased steadily over the subsequent 3 years (to 6.8 percent in 2003). The unemployment rate was 5.4 percent in 2005, equal to the state's 2001 unemployment rate.

Business and Industry Business and industry trends for the CVP and SWP service areas are assumed to be equal to those at the statewide level because of the expanse of these service areas. The trade, transportation, and utilities

industry represents the largest industry, measured by total employees, in California. Government is California's second largest industry, and the professional and business services, educational and health services, and leisure and hospitality industries all play important roles in the state's economy.

Government and Finance The state of California represents the most appropriate level of detail for the CVP and SWP service areas because of the expanse of the service areas and the interdependent nature of government and finance provision. California currently ranks as the seventh largest economy in the world and provides goods and services to more than 37 million people, making it the largest state in the nation. As a result, State government manages a large annual volume of revenues and expenditures. The State of California's proposed 2011–2012 budget includes a total of approximately \$123 billion in revenues and transfers and a total of more than \$127 billion in total expenditures (State of California 2011). Many of the State's expenditures represent grants and other funding made available to local jurisdictions throughout California. These funds may be used for a variety of services, such as health and human services, environmental protection, and resource management.

16.1.2 Population

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

The area surrounding Shasta Dam comprises generally smaller cities and towns with two larger, primary urban areas in each of the two counties (Shasta County and Tehama County). Almost 39 percent of the population in Shasta County and more than 65 percent in Tehama County lived in unincorporated areas in 2006. By comparison, only 17.7 percent of the population in the entire state of California lived in unincorporated areas in 2005. In total, the populations of Shasta and Tehama counties make up less than 1 percent of the total population in California.

The cities of Redding and Red Bluff are the two largest urban areas in the primary study area. Redding, with a total of 89,162 residents in 2006, is the most populous city in the region. Red Bluff is the second largest city in the region and the largest city in Tehama County, with a total of 13,529 residents in 2006. Remaining cities within the primary study area – Anderson, Shasta Lake, and Tehama – all contained fewer than 11,000 residents in 2006.

Although Shasta and Tehama counties are still comparatively small, both counties have been growing substantially during the past 15-20 years. Since 1990, the population of Shasta County has increased by more than 22 percent. During that time, the populations of Redding and Anderson have increased by approximately 33 percent and 26 percent, respectively. A similar situation has been observed in Tehama County, where total population has grown by almost

23 percent since 1990. Most of this new growth has occurred in the unincorporated areas of Tehama County, rather than in existing cities.

Shasta and Tehama counties are expected to continue this growth trend, with substantial growth in Tehama County. The State of California projects that Shasta County's population will increase by 86 percent by 2050 to a total of approximately 332,000 residents (DOF 2007g). This increase is approximately 26 percent higher than expected at the statewide level (60.0 percent).

Lower Sacramento River and Delta

As described in the *Socioeconomics, Population, and Housing Technical Report*, roughly 4 million people live in the nine-county area that makes up the lower Sacramento River and Delta area (Butte, Colusa, Contra Costa, Glenn, Sacramento, San Joaquin, Sutter, and Yolo counties). This population represents approximately 11 percent of California's total population. Sacramento County and Contra Costa County are the two largest counties in the area, with approximately 1.4 million and 1.0 million residents, respectively, in 2006 (DOF 2007a). Of the nine counties in the area, only Sacramento County (56.8 percent) is expected to have grown at a slower rate than California as a whole (60.0 percent increase) through 2050. All other counties in the area are expected to increase their populations by at least 72 percent over that time.

CVP/SWP Service Areas

In 2006, California contained a total of 37,195,240 residents. Approximately 80 percent of the state's population resides in the incorporated areas of its 58 counties (DOF 2007a). Similar to the state as a whole, most of the population of the CVP and SWP service areas is concentrated within urban areas. Outside of these fast-growing population centers, most of the lands within the CVP and SWP service areas are rural, with irrigated agriculture being the predominant land use and driver of the local and regional economies.

California's population has increased by almost 25 percent since 1990 and is projected to increase by approximately 60 percent to more than 59 million people by 2050. This substantial population increase will result in a sizeable increase in water and energy demand across the state. The proportion of the statewide population made up of minority groups has been steadily increasing.

16.1.3 Housing

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

As shown in the *Socioeconomics, Population, and Housing Technical Report*, as would be expected, provision of housing in the primary study area generally coincides with the population trends discussed above. Shasta County (75,240 units in 2006) maintains almost three times the amount of housing units in Tehama County (25,881 units). Of the nearby cities, Redding provides the largest supply of housing in the region, with more than 37,000 housing units.

Redding's units represent roughly half the total housing units in Shasta County. Red Bluff provides the second largest housing stock in the area, with almost 6,000 units.

Overall, single-family dwelling units are the predominant housing type in the primary study area. Vacancy rates were generally higher than the statewide average (5.9 percent), with the exception of Redding (5.0 percent) and Anderson (5.8 percent). Tehama County registered the highest vacancy rate in the primary study area, with 10.8 percent of all housing units vacant. The average household size in jurisdictions of the primary study area ranged from as low as 2.39 persons per household (Tehama) to as high as 2.66 persons per household (Anderson and Shasta Lake). All of these totals were lower than the average persons per household at the statewide level (2.94 persons).

Lower Sacramento River and Delta

As shown in the *Socioeconomics, Population, and Housing Technical Report*, housing characteristics in the nine-county area that makes up the lower Sacramento River and Delta are generally similar to those at the statewide level. In 2006, the area contained approximately 1.5 million housing units. Similar to population, this total represents approximately 11 percent of California's housing stock (approximately 13 million houses). Overall, single-family housing makes up a larger proportion of the total housing stock in the nine-county area (72.5 percent) than recorded at the statewide level (57.3 percent) in 2006 (DOF 2007a).

The vacancy rate in the nine-county area in 2006 was lower (4.0 percent) than the rate observed at the statewide level (5.9 percent). Vacancy in the majority of counties (six of nine) within the lower Sacramento River and Delta area was substantially lower than California as a whole (DOF 2007a).

Average household size in the lower Sacramento River and Delta area is generally lower than that observed at the statewide level. In total, an average of 2.74 persons lived in the households of the nine-county area in 2006. This compared to an average of 2.94 persons for California as a whole (DOF 2007a).

CVP/SWP Service Areas

A description of housing in the CVP and SWP service areas is not included because it would not be affected by the project.

16.2 Regulatory Framework

The assessment of socioeconomic resources is guided primarily by Federal laws and policies. State and local laws and policies typically promote economic development and diversity, environmental justice, public health and safety, housing, and other concerns of the residents within their jurisdictions. As noted

below, NEPA documents must include an assessment of potential conflicts with State and local plans and policies.

16.2.1 Federal

The major Federal laws and regulations guiding the assessment of socioeconomic resources are summarized below.

National Environmental Policy Act

Section 102 of NEPA requires Federal agencies to “insure the integrated use of the natural and social sciences” in planning and decision making (42 U.S. Code Section 4332).

Section 1502.16(c) of NEPA requires Federal agencies to identify potential conflicts between a proposed action and related plans and policies of Federal, state, and local agencies and Indian tribes. This requirement helps Federal agencies identify potential conflicts that may cause adverse effects on the social and economic environment of a study area because many agency and tribal plans and policies are designed to protect the people residing within their jurisdictions and/or the local economy they depend upon for their economic livelihoods.

Council on Environmental Quality

The Council on Environmental Quality’s “Regulations for Implementing the Procedural Provisions of NEPA” (40 Code of Federal Regulations (CFR) 1500 to 1508) provide guidance related to social and economic impact assessment by noting that the “human environment” assessed under NEPA is to be “interpreted comprehensively” to include “the natural and physical environment and the relationship of people with that environment” (40 CFR 1508.14). Furthermore, these regulations require agencies to assess “aesthetic, historic, cultural, economic, social, or health” effects, whether direct, indirect, or cumulative (40 CFR 1508.8). Some Federal agencies, including the U.S. Bureau of Land Management and U.S. Forest Service, have developed socioeconomics-related handbooks and instructional memoranda to help the preparers of Environmental Impact Statements comply with NEPA with respect to socioeconomics resources.

Executive Order 12898—Environmental Justice

In 1994, President Bill Clinton issued Executive Order 12898 regarding environmental justice. This order requires Federal agencies to “identify and address” disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. The Council on Environmental Quality issued guidance in 1997 to help Federal agencies incorporate environmental justice concerns into their NEPA procedures. Environmental justice issues are specifically addressed in Chapter 24, “Environmental Justice,” of this PDEIS.

16.2.2 State

Most state and local governments have plans and policies intended to protect and expand the local and regional economies affecting the communities and residents within their jurisdictions. Some of these plans and policies are also intended to promote public health and safety while minimizing conflicts between new development projects of all types; their associated traffic, air, and noise impacts; and the social environment within which local residents live and work. State plans and policies also frequently address other social and economic impact topics, including fiscal conditions and related public services that affect local residents' quality of life.

In California, the California Environmental Protection Agency adopted its own environmental justice policy in 2004. Pursuant to Sections 71110 to 71113 of the California Public Resources Code, the California Environmental Protection Agency has developed this policy (or strategy) to provide guidance to its resource boards, departments, and offices. It is intended to help achieve the State's goal of "achieving fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation and enforcement of environmental laws and policies."

16.2.3 Regional and Local

Each of California's counties, including Shasta and Tehama counties, has its own plans, ordinances, and other policies designed to protect and improve a wide range of socioeconomic conditions. Specifically addressed in these plans, ordinances, and policies are housing, employment opportunities for minorities and low-income populations and others, economic diversification, and business activity in general.

Shasta County

Shasta County General Plan Two primary elements of the *Shasta County General Plan* (Shasta County 2004) address socioeconomic resources: Housing and Economic Development. The Housing Element of the *Shasta County General Plan* establishes several goals and policies related to ensuring adequate housing provision, especially affordable housing, in the county. Shasta County's housing policies and programs are grouped into six primary categories, each supporting an identified goal. These categories and the goal associated with each are listed below.

- **Housing Supply**
 - **Goal** – To establish and implement policies and programs that will:
 - Contribute to the provision of an adequate supply and diversity of safe, healthy, and affordable housing for all income levels to meet the needs of residents in the unincorporated areas of Shasta County.

- Satisfy the requirements of the Regional Housing Needs Allocation Plan for Shasta County for the 2004-2009 Housing Element period, specifically to realize the construction of new units as follows: Very Low Income – 300 units; Low Income – 255 units; Moderate Income – 1,035 units; and Above Moderate Income – 810 units.
- **Conserve and Improve Existing Affordable Housing**
 - **Goal** – To conserve, improve, and expand the inventory of existing affordable housing stock in the incorporated areas of the County, specifically to realize the conservation and/or rehabilitation of the following units: Rehabilitation (150): 60 units – Very Low Income; 55 units – Low Income; 25 units – Moderate Income; and 10 units – Above Moderate Income; Conservation (150): 90 units – Very Low Income; 53 units – Low Income; and 7 units – Moderate Income.
- **Housing Development Constraints**
 - **Goal** – To continue to remove all County constraints, as is practical and legal, which have the potential to hinder or impede the development of affordable housing projects.
- **Special Needs**
 - **Goal** – To continue to work collectively with local agencies to enhance and expand the outreach programs designed to provide accessible and affordable housing, including supportive services, for those persons with special needs including the elderly, large families, single mothers, children, developmentally and physically disabled persons, the mentally ill, farmworkers, and the homeless.
- **Energy Conservation**
 - **Goal** – To explore, implement, and promote energy conservation practices in all eligible existing and new housing projects.
- **Fair Housing**
 - **Goal** – To continue to utilize all feasible means to promote, expand, and ensure equal access to available, safe, decent, affordable housing opportunities in the unincorporated area without bias or prejudice for any reason for all economic segments of the County.

The Economic Development Element of the *Shasta County General Plan* (Shasta County 2004) establishes the following two overall objectives for economic development:

- **ED-1** – Economic development plans, programs, and policies shall contribute to a stable and healthy economy in Shasta County, which includes provision of a land development pattern, planning process, and

regulatory atmosphere conducive to maintaining employment opportunities for County residents and fostering new economic development.

- **ED-2** – Seek economic diversity that increases the variety, type and scale of business, industrial, and manufacturing activities.

To support these objectives, Shasta County has established three primary policies for implementation. These policies emphasize the reuse and revitalization of existing development and full use of existing infrastructure for new business opportunities. To attract business to Shasta County, a number of incentive programs are employed, including community development block grants, economic assistance through a county redevelopment agency, and business development and retention assistance through an economic development corporation. Additionally, a 50-square-mile State-defined enterprise zone (one of only 39 in California) has been designated in portions of Redding, Shasta Lake, Anderson, and unincorporated Shasta County. Enterprise zones are generally designated in locations characterized by high poverty rates. Businesses locating within these areas may receive State-supported incentives such as sales and use tax credits, hiring assistance tax credits, and special business expense deductions (Shasta County 2004).

Tehama County

In the *Tehama County General Plan*, updated in 2009 (Tehama County 2009), Tehama County set out three “fundamental concepts” that relate to population growth and demographic shifts: (1) accommodating growth, but not limiting growth or accepting uncontrolled growth; (2) locating major growth along the Interstate 5 transportation corridor; and (3) organizing growth according to a range of community types. These concepts emphasize where Tehama County expects to locate new growth and how they plan to accommodate it. Specifically, the Interstate 5 corridor plays a significant role for the placement of new development, and Tehama County attempts to provide a range of housing types for the diversity of needs created within the community. This emphasis on housing diversity may become more crucial as aging residents’ housing preferences change.

The following housing-related goals in the general plan are relevant to the project:

- **Goal HE-3: Adequate Sites** – Ensure the provision of adequate sites and facilities to support future housing needs.
- **Goal HE-5: Housing Conservation** – Work to improve, maintain and conserve the County’s existing housing stock.

- **Goal HE-6: Addressing Constraints** – Address and wherever possible remove, governmental constraints to the maintenance, improvement, or development of housing to meet the needs of County residents.
- **Goal HE-7: Fair Housing/Equal Opportunity** – Promote equal housing opportunities for all persons without discrimination regardless of age, race, sex, marital status, ethnic background, household composition, sources of income, or other arbitrary factors.

Relevant economic development–related goals contained in the draft general plan are as follows:

- **Goal ED-3** – Expand the economic base while maintaining a healthy and diverse local economy that meets the present and future employment, shopping, recreational, public safety, and service needs of Tehama County residents.
- **Goal ED-4** – Work toward providing adequate infrastructure to support commercial, industrial, and recreational development within Tehama County including clean-up of contaminated industrial sites.
- **Goal ED-7:** Protect and enhance environmentally sensitive lands and natural resources while, at the same time, promoting business expansion, retention, and recruitment.

Shasta and Tehama counties function as the primary agencies responsible for implementing policies and programs aimed at addressing employment and labor force issues within the project’s primary study area.

16.3 Environmental Consequences and Mitigation Measures

Based on the review of the affected environment provided in Section 16.1 of this chapter, this section describes the potential environmental consequences resulting from each of the proposed alternatives. Direct, indirect, and cumulative effects of the alternatives are discussed below. When potential environmental consequences are identified, specific mitigation measures to offset the potential effects of the alternatives are presented. Potential effects and mitigation measures address topics related to population and housing, employment and labor force, business and industry, and government and finance.

16.3.1 Methods and Assumptions

Population, Housing, and Demographics

The evaluation and discussion of the potential impacts of the project alternatives on population, demographic, and housing characteristics was based on a review

of published material pertaining to the primary and extended study areas. California Department of Finance population and demographics databases and projections, U.S. Census Bureau population and demographics data, the general plans of jurisdictions within the study areas, and other similar source documents were reviewed.

Population effects were evaluated based on changes in the total number of temporary and/or permanent residents resulting from construction and operations activities that would be completed as a part of project implementation. Housing effects were assessed based on estimated short- and long-term housing needs resulting from population changes expected as a result of the project's construction and operational activities. Effects of the project on local and regional demographic characteristics were assessed quantitatively, when available data allowed. When quantitative analysis of effects was not possible at this broader geographic level, qualitative effects were identified based on the projected makeup (e.g., ethnicity, economic class) of any population changes expected to result from project implementation.

Employment and Labor Force

The determination of potential impacts on employment and the labor force was based on a review of relevant information related to current conditions. Existing documents such as the California Employment Development Department's employment and labor force databases, the Economic Development and Housing elements of the *Shasta County General Plan* (2004), and the *Tehama County General Plan* (2009) were reviewed, along with estimates of employment (temporary and permanent jobs created) for each proposed alternative.

To quantify the potential job creation resulting from each proposed alternative, IMPLAN (IMPact analysis for PLANning) modeling was completed by economists at Reclamation. Developed from the analytical work conducted by Wassily Leontief in the late 1930s, IMPLAN modeling uses a branch of economics known as Input/Output analysis. Input/Output models are essentially accounting tables that trace the linkages of interindustry purchases and sales within a given region, and within a given year. The Input/Output model yields "multipliers" that are used to calculate the total direct, indirect, and induced effects on jobs, income, and output generated per dollar of spending on various types of goods and services in the local economic study area. IMPLAN was originally developed by the U.S. Forest Service and is now maintained and marketed by the Minnesota IMPLAN Group, Inc.

Several assumptions were necessary to complete IMPLAN modeling of the project. The following assumptions were used:

- IMPLAN modeling was completed for CP1 (which involves raising Shasta Dam by 6.5 feet); CP2 (which involves raising the dam by 12.5

feet); and CP3, CP4, and CP5 (all of which involve raising the dam by 18.5 feet).

- Construction periods of approximately 36 months, 48 months, and 60 months, respectively, were assumed under CP1, CP2, and CP3, CP4, and CP5.
- The “local economic study area” was defined as the four-county region of Shasta, Siskiyou, Tehama, and Trinity counties.
- A total labor force of 350 construction workers would be needed for CP4, and a similar level for the other four alternatives in proportion to the required construction activities.
- All 350 construction workers would be drawn directly from the local economic area. (High unemployment in the primary study area and the availability of necessary worker skill sets supports this assumption.)

In addition to IMPLAN modeling, the) was used to determine the effects of the five dam raise alternatives on CVP agricultural users. The Central Valley Production Model (CVPM) is a regional economic model of irrigated agricultural production that simulates the decisions of agricultural producers (farmers) in the Central Valley of California. The model included 22 crop production regions in the Central Valley and 20 categories of crops. Based on the changes in water availability expected with each alternative, the CVPM predicts cropping patterns, land use, and water use in the Central Valley. These predictions are then used to calculate expected changes in net income resulting from each alternative during dry, wet, and average water years. Although the model’s income-related projections were generally used to determine effects on business and industrial activity, the overall change in business net income (or profits) is a good indicator for potential changes in employment opportunities in affected sectors.

Business and Industry

The discussion of potential impacts on business and industry is based on a review of relevant information on current conditions, specifically existing documents such as California Employment Development Department documents, the Economic Development Element of the *Shasta County General Plan* (2004) and the *Tehama County General Plan* (2009), and estimates of business and industry effects for each action alternative.

To quantify the potential effect on job creation and personal incomes resulting from each alternative, IMPLAN modeling was completed by Reclamation economists. A description of IMPLAN modeling, generally, and the specific assumptions used related to the project are provided in the previous section.

Government and Finance

The determination and discussion of potential impacts on government and finance was based on a review of relevant information on current conditions, specifically documents such as the Economic Development Element of the *Shasta County General Plan* (2004) and the *Tehama County General Plan* (2009), and estimates of local government and finance effects for each dam-raise alternative.

Because no quantitative analysis of the effect of the action alternatives on local government and finance has yet been completed, this analysis depends heavily on a qualitative discussion of potential impacts. Areas of potential impacts were identified by comparing existing conditions and probable future conditions. In many cases, the estimates completed as part of the IMPLAN and CVPM modeling served as the basis for impact estimates. These two models determine expected trends in employment, personal incomes, business incomes, agricultural production, and other data types to quantifiably estimate the impacts of the proposed alternatives. Because these local characteristics directly influence activities at the local level, they represent critical considerations in the analysis and conclusions presented in this section.

16.3.2 Criteria for Determining Significance of Effects

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by, or result from, the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an Environmental Impact Statement must be prepared. An environmental document prepared to comply with CEQA must identify the potentially significant environmental effects of a proposed project. A “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (State CEQA Guidelines, Section 15382). CEQA also requires that the environmental document propose feasible measures to avoid or substantially reduce significant environmental effects (State CEQA Guidelines, Section 15126.4(a)).

The following significance criteria were developed based on guidance provided by the State CEQA Guidelines, and consider the context and intensity of the environmental effects as required under NEPA. Impacts of an alternative on socioeconomics, population, and housing would be significant if project implementation would do any of the following:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)
- Displace substantial numbers of people or housing, necessitating the construction of replacement housing elsewhere

- Produce a substantial burden on the existing housing stock within the local community because of an increased housing demand created by nonlocal project employees
- Require sizeable numbers of new workers in a particular industrial sector from outside the local area during construction or operation for effective implementation
- Substantially increase the risk of housing or other property damage caused by flooding
- Cause a substantial decrease in the number of opportunities for temporary or long-term direct employment within the primary study area or the extended study area (within Shasta County, Tehama County, or nearby cities and towns, specifically Redding, Anderson, Shasta Lake, and Red Bluff)
- Compete with established industries for workers within the labor force or associated resources to the extent that there would be a shortage of workers available to related businesses
- Cause a substantial decrease in the number of opportunities for temporary or long-term increases in personal and/or disposable incomes within the primary or extended study area (within Shasta County, Tehama County, or nearby cities and towns, specifically Redding, Anderson, Shasta Lake, and Red Bluff)
- Considerably decrease the sales and/or incomes of businesses in the primary or extended study areas

Significance statements are relative to both existing conditions (2005) and future conditions (2030) unless stated otherwise.

16.3.3 Topics Eliminated from Further Discussion

In contrast to the primary study area and the lower Sacramento River and Delta portion of the extended study area, additional flood control capacity provided by CP1–CP5 is not expected to substantially affect the CVP and SWP service areas beyond the lower Sacramento River and Delta. Dam operations (i.e., storage and release scenarios) in the CVP and SWP service areas are expected to continue according to management plans similar to those currently in place. Therefore, no flood-related impact on population and housing would occur in the CVP and SWP service areas. This topic is not discussed further under CP1–CP5.

16.3.4 Direct and Indirect Effects

Similar to the approach used in Section 16.1, “Affected Environment,” the following discussion of environmental consequences in the primary study area

does not separate Shasta Lake and vicinity from the upper Sacramento River (Shasta Dam to Red Bluff) because of the regional interdependence of socioeconomic characteristics. Instead, environmental consequences are discussed for the entire primary study area and the two counties that encompass it, Shasta and Tehama counties.

No-Action Alternative

Under the No-Action Alternative, no additional Federal action would be taken to address water reliability issues or increase anadromous fish survival. Therefore, Shasta Dam and Shasta Lake would continue to operate as they currently do, with some future modifications (currently not known) expected into the future. With the No-Action Alternative, water reliability is expected to become an increasing issue as demand for water increases to meet the needs of California's growing population. Over time, water conservation and reuse efforts would increase and water provision is expected to shift from such areas as agricultural production to urban uses. Environmental restoration, flood control, and hydropower generation are expected to continue similar to existing conditions. Like water demand, electricity demand in California is expected to increase substantially in the future. This increased demand is expected to create localized shortages in energy availability over time.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff) Under the No-Action Alternative, population, demographic, and housing conditions are expected to continue following current growth trends described in Section 16.1, "Affected Environment"; the projected employment and labor force characteristics summarized in Section 16.1 would also continue. The relatively large number of new construction-related jobs that would be created by all five action alternatives would not be created. Therefore, this alternative would have no impact on population and housing or on employment and the labor force.

In addition, the business and industrial activities of the primary study area would continue as summarized in Section 16.1. The relatively large and temporary increase in business activity that would occur during construction would not occur. Therefore, the No-Action Alternative would have no impact on business and industrial activity.

Furthermore, the local government and finance conditions and trends projected in Section 16.1 would continue because new facilities would not be constructed and existing facilities would not be altered, expanded, or demolished. The positive fiscal effects associated with the increase in sales and income tax revenue from construction-related spending would not occur. Therefore, the No-Action Alternative would have no impact on government and finance.

Lower Sacramento River and Delta Under the No-Action Alternative, the projected population, demographic, and housing conditions and development

conditions described in Section 16.1, “Affected Environment,” would remain unchanged. There would be no impact on population, demographics, or housing.

In addition, the local government and finance conditions described in Section 16.1 would continue because no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. The positive fiscal effects associated with the increase in sales and income tax revenue resulting from construction-related spending would not occur. Therefore, the No-Action Alternative would have no impact on government and finance.

The impacts of the No-Action Alternative on employment and the labor force and on business and industrial activity in the lower Sacramento River and Delta area are described below.

Impact Socio-1 (No-Action): Potential for Reduced Employment Opportunities for Lower Sacramento River and Delta Area Residents The No-Action Alternative has the potential to result in periodic water and power supply disruptions from increasing demand on the existing supply caused by population growth. These disruptions could result in adverse economic effects on the lower Sacramento River and Delta portion of the extended study area. This impact would be potentially significant.

Under the No-Action Alternative, the risk of CVP and SWP water supply disruptions and Western Area Power Administration and DWR power supply disruptions in the lower Sacramento River and Delta area would be higher than the risk of such disruptions in the long term under each of the five action alternatives. Although the likelihood of such disruptions is difficult to predict, the CalSim-II modeling performed to simulate future water and power supply conditions under 2030 No-Action Alternative conditions, and 2030 conditions under each of the action alternatives, indicates that all five action alternatives would enhance CVP and SWP water and power supply conditions relative to 2030 No-Action Alternative conditions. (Please note that CalSim modeling of power supply conditions for the 2030 No-Action Alternative is not currently available.)

An increase in the risk of water and power supply disruptions could in turn increase the likelihood that temporary and adverse socioeconomic effects would take place during related reductions in economic activity, including reductions in employment opportunities. Adverse economic effects during times of drought, blackouts, or other types of water or power supply disruptions could also include delays in hiring employees or layoffs if businesses experience water and/or power rate increases as a result of water and power purveyors seeking other, more expensive replacement sources. This impact would be potentially significant. Mitigation is not required for the No-Action Alternative.

Impact Socio-2 (No-Action): Potential for Temporary Disruptions in Business and Industrial Activity in the Lower Sacramento River and Delta Area If water

or power supply disruptions were to occur, they could cause temporary reductions in business and industrial activity, especially where water- and power-intensive industries and businesses are found. This impact would be potentially significant.

As discussed under Impact Socio-1 (No-Action) above, an increase in the risk of water or power supply disruptions could occur in the lower Sacramento River and Delta portion of the extended study area under the No-Action Alternative. If such disruptions were to occur, they could cause temporary reductions in business and industrial activity, especially in areas where water- and power-intensive industries and businesses are found. Because the No-Action Alternative could have adverse effects on businesses and industrial activity in the case of drought, blackouts, or other types of water or power supply disruptions, this impact would be potentially significant. Mitigation is not required for the No-Action Alternative.

CVP/SWP Service Areas Under the No-Action Alternative, the projected population, demographic, and housing conditions and development conditions described in Section 16.1, “Affected Environment,” would remain unchanged. No impact would occur. Therefore, potential effects of the No-Action Alternative on population, demographics, or housing in this geographic region are not discussed further.

In addition, the local government and finance conditions in the CVP and SWP service areas described in Section 16.1 would continue. The positive fiscal effects associated with the increase in sales and income tax revenue resulting from construction-related spending would not occur. Therefore, no impact would occur under the No-Action Alternative. Potential effects of this alternative on government and finance in this geographic region are not discussed further.

The impacts of the No-Action Alternative on employment and the labor force and on business and industrial activity in the CVP and SWP service areas are described below.

Impact Socio-3 (No-Action): Potential for Reduced Employment Opportunities for Residents Within the CVP and SWP Service Areas The No-Action Alternative has the potential to result in periodic water and power supply disruptions from increasing demand on the existing supply caused by population growth. These disruptions could result in variability in economic activity, which could reduce or delay employment opportunities in the CVP and SWP service areas. This impact would be potentially significant.

Under the No-Action Alternative, the risk of CVP and SWP water supply disruptions and Western Area Power Administration and DWR power supply disruptions would be higher than the risk of such disruptions in the long term under each of the five proposed action alternatives. The likelihood of such

disruptions is difficult to predict; however, the CalSim-II modeling performed to simulate future water and power supply conditions under 2030 No-Action Alternative conditions, and 2030 conditions under each of the action alternatives, indicates that all five action alternatives would enhance CVP and SWP water and power supply conditions relative to 2030 No-Action Alternative conditions. (Please note that CalSim modeling of power supply conditions for the 2030 No-Action Alternative is not currently available.)

An increase in the risk of water and power supply disruptions, including drought, blackouts, or other types of water or power disruptions, could in turn increase the likelihood of temporary and adverse socioeconomic effects. Adverse economic effects during times of these disruptions could reduce economic activity and also result in delays in hiring employees or layoffs if businesses were to experience water and/or power rate increases as a result of water and power purveyors seeking other, more expensive replacement sources. This impact would be potentially significant. Mitigation is not required for the No-Action Alternative.

Impact Socio-4 (No-Action): Potential for Temporary Disruptions in Business and Industrial Activity in the CVP and SWP Service Areas If water or power supply disruptions were to occur, they could cause temporary reductions in business and industrial activity, especially where water- and power-intensive industries and businesses are found. This impact would be potentially significant.

As discussed under Impact Socio-3 (No-Action) above, an increase in the risk of water or power supply disruptions could occur in the CVP and SWP service areas under the No-Action Alternative. If such disruptions were to occur, they could cause temporary reductions in business and industrial activity, especially in areas where water- and power-intensive industries and businesses are found. Because the No-Action Alternative could have adverse effects on businesses and industrial activity in the case of drought, blackouts, or other types of water or power supply disruptions, this impact would be potentially significant. Mitigation is not required for the No-Action Alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

CP1 would increase the full pool capacity of Shasta Lake to 4,810 thousand acre-feet (TAF) and increase the surface area of the pool to 30,710 acres. It is expected that implementing CP1 would result in the replacement or modification of eight bridges and relocation of approximately 45 existing structures. The total construction cost associated with CP1 would be approximately \$827 million and the annual operational cost would be \$42.6 million. This alternative would generate approximately \$27.0 million in annual water supply reliability benefits and \$15.1 million average annual equivalent anadromous fish restoration benefits. CP1 would increase hydropower

generation by approximately 42 gigawatt-hours (GWh) per year, equivalent to approximately \$2.4 million in hydropower benefits.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Socio-1 (CP1): Short-Term Increase in Population and Housing Demand in the Primary Study Area Resulting from Construction-Related Activities According to Reclamation estimates, approximately 450 new direct jobs would be created as a result of construction activities associated with CP1. All 450 construction workers are expected to come from the local labor force; therefore, a temporary population increase is not expected. This impact would be less than significant.

Approximately 450 new construction workers would be needed over the 36-month construction period to support the construction activities related to the 6.5-foot raise of Shasta Dam. Given the availability, experience, and expertise of the existing labor force within the primary study area, it is expected that the necessary workers would be available in the surrounding two-county area (Shasta and Tehama counties). Therefore, no construction workers are expected to be sourced from outside the primary study area, and no employees (or very few) would need to relocate to the project area during the construction period. Even if a relatively small number of workers were to come from outside the local area, sufficient housing capacity (e.g., rental housing, motel, and apartment vacancies) exists in the area. Thus, effects on population and housing in the primary and extended study areas are not expected; if they were to occur, they would be very minor. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-2 (CP1): Short-Term Increases in Direct, Indirect, and Induced Employment in the Primary Study Area Related to Construction Activities

Construction activities associated with CP1 are assumed to generate approximately 450 new construction jobs, 580 indirect jobs in various construction-related support industries, and 790 induced jobs because of increased household spending in the primary study area. Individuals to fill these jobs are expected to be drawn from the local community. These new jobs are expected to provide important but temporary employment opportunities to many unemployed construction workers in the primary study area. This impact would be beneficial.

Concrete workers, workers with large-scale construction experience, general laborers, and others would be drawn from the existing local construction industry. These jobs represent a relatively small increase (less than 0.6 percent) in the total labor force in the two counties of the primary study area, but would represent a substantial increase in employment for many of the cities surrounding the project site, where employment has consistently been below the statewide average (EDD 2011).

Although the increase in employment represents a small percentage increase for the two-county area, the employment opportunities created by CP1 represent a substantial contribution in counties that have consistently registered high unemployment rates (EDD 2011). Both Shasta and Tehama counties were characterized by unemployment rates around 7 percent between 2002 and 2005. Similarly, since 2000, the cities of Anderson, Shasta Lake, and Red Bluff have all experienced unemployment rates 2 percentage points or more above the statewide average (EDD 2011).

As stated above, IMPLAN modeling calculates “direct” employment generated by individual alternatives as well as “indirect and induced” positions that are created by construction-related and operational activities. Indirect employment may be to support hiring in businesses that provide materials to the construction effort; in service-related industries that provide food, beverages, and other goods to construction workers; or in more technical industries, such as consulting firms and other businesses. Induced employment is jobs that are created in the region due to increased household spending and not limited to construction-related activities.

In addition to the 450 direct construction-related jobs to be created from CP1, an additional 580 indirect jobs are expected to be created from construction support industries, and 790 induced jobs from increased household spending near the project area. The generation of 1,820 new positions (direct, indirect, and induced) approximately represents a 1.5 percent increase in the total 2004 labor force of the four counties of the local economic study area used in the IMPLAN modeling (Shasta, Tehama, Trinity, and Siskiyou), which totaled approximately 123,000 employees. A 1.5 percent increase in employment represents a substantial increase in total employment, especially for an area experiencing the recent unemployment rates observed in the primary study area.

Because CP1 would create direct, indirect, and induced jobs in an area with high unemployment rates, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-3 (CP1): Potential for Temporary Reduction in the Labor Force of Related Industrial Sectors in the Primary Study Area as a Result of Direct Construction-Related Employment With the creation of 450 new construction jobs resulting from CP1, the potential exists for workers from other industries to move to jobs related to construction at Shasta Dam. Given the size of the construction industry in the primary study area, and the high unemployment rate in the area, this impact would be less than significant.

As the 450 new positions created under CP1 are filled, the potential exists for the positions to be filled by individuals currently working in related industries within the local community. This transfer of workers from related industries to the Shasta project could create a labor shortage in the related industry, if particularly skilled workers are required. In 2004, Shasta County registered

4,500 employees in the construction industry, while construction industry workers in Tehama County equaled only 650 individuals, for a total of 5,150 construction workers in the area (EDD 2011). Given total employment levels and current unemployment trends in the primary study area, the 450 new construction-related jobs are not expected to substantially affect the local labor force. If a high number of workers were to be sourced from Tehama County, a limited effect could be observed because of the small number of workers in the construction industry in that county. Overall, however, this impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-4 (CP1): Short-Term Increases in Direct, Indirect, and Induced Personal Income Paid to Employees in the Primary Study Area Hired for Construction-Related Activities Based on calculations completed as a part of Reclamation's IMPLAN socioeconomic model process, it is estimated that more than \$126.1 million in personal income would be directly paid to employees in the primary study area each year of construction under CP1. This amount of personal income is a more than 1.6 percent increase in annual income in the local economic study area. In addition, more than \$57.4 million is expected to be generated in various construction-related and other industries in the primary study area each year of construction under CP1. This impact would be beneficial.

In 2004, total personal income in the four counties of the local economic study area was in excess of \$7.6 billion. With more than \$4.8 billion in personal income that year, Shasta County contributed more than half of this total. Based on the results of modeling performed using Reclamation's IMPLAN model, an estimated \$126.1 million would be directly paid each year to the approximately 450 construction workers required to complete the job during the proposed 36-month construction period for CP1. Based on the IMPLAN estimate, the increase in annual personal incomes expected from CP1 represents an increase of approximately 1.6 percent. The positions expected from implementation are anticipated to be union positions and would be paid according to union wage and benefit standards.

Based on the generation of 1,370 indirect and induced jobs resulting from implementation of CP1, it is estimated that \$57.4 million in personal income would be available for residents of the local economic study area each year during the proposed 36-month construction period. This personal income would be generated in industries that would support the construction efforts at Shasta Dam.

Taken together, it is expected that direct, indirect, and induced personal income resulting from CP1 would exceed \$183.6 million per year of construction activities within the local economic study area (used in IMPLAN modeling). The \$183.6 million in personal income generated represents approximately 2.4 percent of all annual personal income in the local economic study area in 2004.

Increases in personal income projected for the local economic study area are expected to be most prominent in Siskiyou, Tehama, and Trinity counties, where total personal income recorded in 2004 was 25 percent of that registered in Shasta County. In general terms, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-5 (CP1): Short-Term Increases in Sales and Profits for Businesses in the Primary Study Area that Support the Construction Industry Most of the construction materials used for CP1 are expected to be purchased within the primary study area. These purchases would provide the local economy with increased sales and profits over the 36-month construction period. This impact would be beneficial.

A large amount of construction material (e.g., concrete, rock) would be needed to raise Shasta Dam by 6.5 feet, as prescribed in CP1. Of this material, it is expected that most would be sourced from businesses within the primary study area. As a result of the large quantity of purchases expected, local businesses would experience temporary increases in sales and profits over the 36-month construction period. Increased sales and profits could be reinvested into existing businesses, invested in new ventures or diversification, translated into increased salaries and wages for employees, or used in other ways. The exact scale of the increase in business sales and profits has not yet been calculated, but it is expected that this amount would be substantial. Therefore, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-6 (CP1): Short-Term Increase in State and Local Sales Tax Revenues in the Primary Study Area from Construction-Related Personal Income and Purchases As stated above, implementation of CP1 is expected to result in a substantial increase in total personal income (direct, indirect, and induced) during the construction period. This additional income, in combination with the construction-related purchases in the primary study area, would result in a substantial increase in local sales tax revenues from increased consumer spending in nearby cities and counties. Construction-related activities under CP1 would likely also result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. The exact amount of State and local sales tax revenue increases has not yet been calculated; however, this impact would be beneficial.

Based on the results of modeling performed using Reclamation's IMPLAN model, implementation of CP1 is expected to generate more than \$550.7 million in total personal income, with approximately \$378.4 million in direct income and \$172.3 million in indirect and induced income during the proposed 36-month construction period. In addition to this increase in personal incomes, most of the construction materials would be purchased within the primary study area, generating a substantial amount of revenue and profits for local businesses.

In combination, increased personal incomes and construction-related spending are expected to substantially increase the total sales tax revenues of local jurisdictions within the primary study area. Larger amounts of local sales tax revenue could then be used to establish new programs and initiatives or bolster existing ones through additional funding. New and improved programs and initiatives would provide benefits to local residents.

As a result of the increased employment and personal incomes anticipated from implementation of CP1, it is expected that a temporary increase in State sales and income tax would likely occur. During the construction period, more than \$550.7 million in personal income is expected to be generated by direct, indirect, and induced employment produced by the project. The increase in personal income would increase spending at local businesses within the primary study area, and this additional spending would result in sizeable State sales tax revenues. This increased revenue source would likely return to the primary study area via statewide programs and policies.

For the reasons described above, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-7 (CP1): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Primary Study Area As a result of the added reservoir capacity created by CP1, the overall risk of flooding below Shasta Dam and its related consequences to the primary study area are expected to be reduced. Although heavy-rain events would continue to occur in the region and locally, the project is intended to provide greater flexibility in flood control downstream because of the increased capacity of the reservoir. As a result, there would be less damage to existing structures and a smaller loss of potential future development; this, in turn, would reduce salary and wage losses for residents of the primary study area, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

In Reclamation's *Initial Alternatives Information Report* (Reclamation 2004), flood control was identified as a secondary objective of the project. Increased flood control is to be emphasized when the two primary objectives of the project, increased fish survival and increased water supply reliability, can be met. Periodic flood events in the Sacramento Valley frequently cause substantial damage to properties adjacent to the valley's many waterways. Currently, Shasta Dam provides substantial protection from such flooding damage for downstream residents.

CP1 would increase the storage capacity of Shasta Lake by 256,000 acre-feet. This added capacity would provide greater flexibility in Reclamation's ability to use the reservoir for flood control purposes, thereby increasing the threshold at which seasonal heavy-rain events produce flood conditions downstream from the dam. The benefits of this increase in capacity and related flood control options would be most evident along the upper Sacramento River within the

primary study area. Structures and inhabitants in this floodplain experience the most direct effects from storage releases during flood events. CP1 would reduce the frequency, magnitude, and duration of future flood events that have affected structures and their residents in this part of the primary study area in the past.

The loss of jobs and adverse effects on economic well-being and livelihoods is an often-overlooked consequence of catastrophic flood events. Avoiding a larger number of these events, and possibly decreasing the magnitude and duration of flooding under certain high-flow events, is expected to reduce the overall economic hardships faced by residents of the primary study area.

Structures and businesses located on the river and inhabitants of the floodplain experience the most direct effects from flood releases downstream. However, flood events could also affect those who do not live on the river or in the floodplain but work downstream from the dam at businesses subject to flood damage. The reduced risk of flood events associated with CP1 is expected to also reduce the business and personal income losses resulting from substantial damage to structures and businesses located adjacent to downstream waterways in the primary study area.

Implementation of CP1 would reduce damage to structures, loss of business and personal income, loss of jobs, and other adverse effects on economic well-being in the primary study area. Therefore, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-8 (CP1): Long-Term Increases in Direct Employment in the Primary Study Area Related to Project Operations In the long term, it is expected that implementation of CP1 would create at least two new maintenance-related positions for the Shasta Dam facilities. These two positions are expected to be permanent and would continue once the 36-month construction period is complete. This impact would be beneficial.

Reclamation estimates that with the 6.5-foot increase of Shasta Dam proposed in CP1, at least two new permanent maintenance positions would be required to ensure efficient operation of dam facilities. These two positions are expected to be union positions, and would consequently provide union-level wages and benefits. Both positions would be filled after completion of the construction activities associated with CP1 and would continue for the foreseeable future. This impact, though small, would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Lower Sacramento River and Delta

Impact Socio-9 (CP1): Potential Temporary Increase in Indirect Employment in Construction-Related Businesses of the Lower Sacramento River and Delta Construction activities associated with CP1 have the potential to result in a temporary increase in indirect employment within the lower Sacramento River and Delta portion of the extended study area. Depending on the location of

construction materials sourced outside of the primary study area, indirect increases in employment within construction-related businesses may result in the lower Sacramento River and Delta area. This impact would be beneficial.

As a result of construction activities that would be completed during implementation of CP1, temporary increases in indirect employment would be expected in the lower Sacramento River and Delta portion of the extended study area. It is expected that a small amount of the construction materials necessary for CP1 are expected to be obtained from outside the primary study area. During the construction period, businesses that provide construction materials would be expected to increase employment to meet project demand. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-10 (CP1): Short-Term Increases in Sales and Profits for Businesses in the Lower Sacramento River and Delta Area That Support the Construction Industry It is expected that a small amount of the construction materials used for CP1 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the lower Sacramento River and Delta area during the construction period. This impact would be beneficial.

A significant amount of construction materials would be needed to raise Shasta Dam by 6.5 feet, as prescribed in CP1. Of these materials, it is expected that a small amount would be purchased from construction-related businesses in the extended study area, including the lower Sacramento River and Delta area. These purchases may include raw or refined materials, infrastructure-related products, and/or equipment required for the construction process. As a result of the purchases expected, businesses in the lower Sacramento River and Delta portion of the extended study area are expected to experience a temporary increase in sales and profits during the construction period. Similar to businesses within the primary study area, increased sales and profits could be reinvested into the existing businesses, invested in new ventures or diversification, translated into increased salaries and wages for employees, or used in other ways. The exact scale of the increase in business sales and profits within the lower Sacramento River and Delta area has not yet been calculated, but it is assumed that this amount would be substantial. Therefore, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-11 (CP1): Short-Term Increase in State Sales and Income Tax Revenues in the Lower Sacramento River and Delta Area from Construction-Related Personal Income and Purchases In addition to local tax revenues, CP1 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

As a result of the increased employment and personal incomes anticipated as a part of implementation of CP1, it is expected that a short-term increase in State sales and income tax revenues would also occur. In the construction period, more than \$550.7 million in personal income would be generated by direct, indirect, and induced employment produced by the project. This large amount of income would direct substantial income tax revenues to the State via State income tax requirements. These additional revenues would contribute substantially to the State budget and would be distributed to jurisdictions within the lower Sacramento River and Delta portion of the extended study area via statewide programs and policies. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-12 (CP1): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Lower Sacramento River and Delta Area As a result of the added reservoir capacity under CP1, the overall risk of flooding and its related consequences below Shasta Dam is expected to be reduced. Although heavy-rain events would continue to occur in the region, CP1 is intended to provide greater flexibility in flood control in the lower Sacramento River and Delta area because of the increased capacity of the reservoir. As a result, less damage to existing structures and a smaller loss of potential future development would be expected; this, in turn, would reduce salary and wage losses for residents in and near the lower Sacramento River floodplain and the Delta resulting from these catastrophic events, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

Residents of the lower Sacramento River and Delta portion of the extended study area would benefit from the additional flexibility and flood control operations during flood events that would occur as a result of CP1. With the additional capacity provided by this alternative, the effects of large rain events would be reduced as a result of the improved management of systemwide flood control operations. Hydroelectric facilities within the lower Sacramento River and Delta area would likely experience flood events of somewhat less duration and magnitude, thus reducing the potential effects on vulnerable houses and property within the floodplain.

The loss of jobs and adverse effects on economic well-being and livelihoods is an often-overlooked consequence of catastrophic flood events. Avoiding a larger number of these events, and possibly decreasing the magnitude and duration of floods under certain high-flow events, is expected to reduce the overall economic hardships faced by residents of the lower Sacramento River and Delta areas. The effects of heavy-rain events would be better managed and the risk of flood-related effects could be reduced as far downstream as Sacramento.

In addition, fewer flooding events would result in less damage to businesses located adjacent to waterways during some flood events. This reduction in damage would reduce the amount of time employees would be without pay

because of flood conditions and damage. This reduction in flood damage would reduce residents' salary and wage losses from these catastrophic events.

Implementation of CP1 would reduce damage to structures, loss of business and personal income, loss of jobs, and other adverse effects on economic well-being in the lower Sacramento River and Delta areas. Therefore, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CVP/SWP Service Areas

Impact Socio-13 (CP1): Short-Term Increases in Sales and Profits for Businesses in the CVP and SWP Service Areas That Support the Construction Industry A small amount of the construction materials used during construction under CP1 are expected to be purchased within the extended study area, including the CVP and SWP service areas. These purchases are predicted to increase sales and profits of businesses within the CVP and SWP service areas during the construction period of CP1. This impact would be beneficial.

A small amount of the construction materials used during construction under CP1 are expected to be purchased from construction-related businesses in the extended study area, including the CVP and SWP service areas. These purchases may include raw or refined materials, infrastructure-related products, and/or equipment required for the construction process. As a result of the large quantity of purchases expected, businesses in the CVP and SWP service areas are expected to experience a short-term increase in sales and profits over the construction period. The exact scale of the increase in business sales and profits within the CVP and SWP service areas has not yet been calculated, but it is assumed that this amount would be substantial. Therefore, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-14 (CP1): Potential Temporary Reduction in Shasta Project Water or Hydropower Supplied to the CVP and SWP Service Areas During Construction Implementation of CP1 may require temporarily reducing the reservoir level either throughout the construction period or at critical times. This reduction in the reservoir level could temporarily reduce the amount of water or hydropower available from the dam and related hydropower infrastructure. Should this occur, sources of replacement water or hydropower would need to be secured. If these replacement resources were substantially more expensive, a minor negative effect on water or power customers may result. This impact would be potentially significant.

Construction activities implemented as part of CP1 would require adding large quantities of concrete to Shasta Dam. To complete this sizeable task, it may be necessary to reduce the reservoir's water table to accommodate construction. A reduced water table may be needed either for the duration of construction or at critical points in the construction process. Regardless of the approach needed, a reduced water table would limit the amount of water and/or hydropower that would be available from the dam for use in the CVP and SWP service areas. As

a result, there could be periods in which water or hydropower availability within the CVP and SWP system may be more limited, especially during dry periods.

To address potential temporary shortages in water or hydropower caused by reduced availability at Shasta Dam, replacement water or hydropower supplies would need to be sourced elsewhere to maintain current service needs. Depending on the conditions of the water or energy markets at the time of need, these replacement resources could be more expensive than water or hydropower obtained from Shasta Dam. The additional expense of obtaining water or hydropower resources could produce a minor negative effect on water and power customers if replacing these resources would be substantially more expensive. This impact would be potentially significant. Mitigation for this impact is proposed in Section 16.3.5.

Impact Socio-15 (CP1): Short-Term Increase in State Sales and Income Tax Revenues in the CVP and SWP Service Areas from Construction-Related Personal Income and Purchases CP1 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the CVP and SWP service areas. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

As a result of the increased employment and personal incomes anticipated as a part of implementation of CP1, it is expected that a short-term increase in State sales and income tax revenues would occur. During the construction period for CP1, more than \$550.7 million in personal income would be generated by direct, indirect, and induced employment produced by the project. This large amount of income would direct substantial income tax revenues to the State via State income tax requirements. These additional revenues would contribute substantially to the State budget and would be distributed to jurisdictions within the CVP and SWP service areas via statewide programs and policies. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-16 (CP1): Long-Term Increase in Agricultural Income and Jobs in the CVP and SWP Service Areas as a Result of Improved Water Availability and Reliability Based on CVPM modeling, improved water availability and reliability expected to result from implementation of CP1 would substantially increase agricultural net income in the CVP and SWP service areas and increase the number of agricultural positions in these areas. This increase in production and jobs would contribute substantially to the continuation of this already strong industry in California. This impact would be beneficial.

Of the CVP and SWP's water users, agricultural users benefit the most from increased water availability and reliability because of more consistent irrigation opportunities throughout the year. Based on the outputs of CVPM modeling, CP1 would improve long-term water availability and reliability within the CVP

and SWP service areas via adding water storage capacity. Long-term improvements to the availability and reliability of water are expected to allow farmers within the CVP and SWP service areas to substantially increase agricultural production, especially in dry years. It was estimated that CP1 would increase the net agricultural income within the 22 CVPM regions by more than \$3.3 million in an average year and up to \$11.1 million during dry years. In wet years, net income is projected to decrease slightly (\$400,000).

To support the increased agricultural production expected during the implementation of CP1, more agricultural workers would be needed. The CVPM does not estimate the number of additional agricultural positions that would be created as a result of improved irrigation, but the resulting increase in water reliability and availability has the potential to strengthen and extend the existing growing season in the CVP and SWP service areas. This would enable existing employees to work for a longer period in the fields, while also increasing the total workers needed during the growing season. These additional agricultural workers are expected to be distributed across the CVP and SWP service areas. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-17 (CP1): Reduction in Risk of Potential Water and Power Shortages (and Related Economic Activity) in the CVP and SWP Service Areas as a Result of Long-Term Improvements to Water and Power Supply Reliability

Implementation of CP1 would substantially increase Shasta Dam's storage capacity. As stated in Impact Socio-16 (CP1), this additional storage capacity would improve the long-term availability and reliability of water in the CVP and SWP service areas. Beyond increasing agricultural production, this improved availability and reliability would reduce the long-term risk of urban water and power shortages, and their related adverse economic consequences, in the future. This impact would be beneficial.

In addition to improving agricultural production, implementation of CP1 would increase water availability and reliability for industrial and urban users within the CVP and SWP service areas. For these users, the additional 265,000 acre-feet of storage capacity proposed by CP1 is expected to substantially reduce the long-term risk of water and power shortages from periodic flow constraints. As a result, water and power users would likely experience fewer water and power shortages caused by reduced reservoir levels, such as those experienced in dry years. This reduction in water and power shortages, along with avoidance of the related loss of economic production, represents a substantial benefit for users in the CVP and SWP service areas. This benefit would be most pronounced for water- and power-intensive industries that are heavily dependent on consistent water and power availability. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

CP2 would increase the full pool capacity of Shasta Lake to 4,995 TAF and increase the surface area of the pool of the reservoir to 31,350 acres. It is expected that implementing CP2 would result in the replacement or modification of eight bridges and relocation of approximately 100 existing structures. The total construction cost associated with CP2 would be approximately \$913 million and the annual operational cost would be \$46.4 million. This alternative would generate approximately \$25.0 million in annual water supply reliability benefits and \$9.6 million average annual equivalent anadromous fish restoration benefits. CP2 would increase hydropower generation by approximately 68 GWh per year, equivalent to approximately \$3.9 million in hydropower benefits.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Socio-1 (CP2): Short-Term Increase in Population and Housing Demand in the Primary Study Area Resulting from Construction-Related Activities According to Reclamation estimates, approximately 370 new direct jobs would be created as a result of construction activities associated with CP2. All 370 construction workers are expected to come from the local labor force; therefore, a short-term population increase is not expected. This impact would be less than significant.

This impact is similar to Impact Socio-1 (CP1). A 48-month construction period was considered here for CP2. As described above under Impact Socio-1 (CP1), a short-term population increase is not expected with implementation of CP2. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-2 (CP2): Short-Term Increases in Direct, Indirect, and Induced Employment in the Primary Study Area Related to Construction Activities

Construction activities associated with CP2 are assumed to generate approximately 370 new direct construction jobs, 480 indirect jobs in various construction-related support industries, and 650 induced jobs because of increased household spending in the primary study area. Individuals to fill these jobs are expected to be drawn from the local community. These new jobs are expected to provide important but temporary employment opportunities to many unemployed construction workers in the primary study area. This impact would be beneficial.

This impact is similar to Impact Socio-2 (CP1). Under CP2, approximately 370 new short-term, direct construction jobs would be created, in addition to 480 indirect jobs expected to be created in various construction-related support industries, and 650 induced jobs created because of increased household spending near the project area. Total direct, indirect, and induced employment under CP2 would be less than CP1; however, these positions would last

approximately 48 months under CP2, compared to 36 months under CP1. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-3 (CP2): Potential for Temporary Reduction in the Labor Force of Related Industrial Sectors in the Primary Study Area as a Result of Direct Construction-Related Employment With the creation of 370 new construction jobs resulting from CP2, the potential exists for workers from other industries to move to jobs related to construction at Shasta Dam. Given the size of the construction industry in the primary study area, and the high unemployment rate in the area, this impact would be less than significant.

This impact would be similar to Impact Socio-3 (CP1) and would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-4 (CP2): Short-Term Increases in Direct, Indirect, and Induced Personal Income Paid to Employees in the Primary Study Area Hired for Construction-Related Activities Based on calculations completed as a part of Reclamation's IMPLAN socioeconomic model process, it is estimated that more than \$104.4 million in personal income would be directly paid to employees in the primary study area each year of the 48 month construction period under CP2. This amount of personal income is a more than 1.4 percent increase in annual income in the local economic study area. In addition, approximately \$47.6 million in indirect and induced income is expected to be generated in various construction-related and other industries in the primary study area each year of construction under CP2. This impact would be beneficial.

This impact is similar to Impact Socio-4 (CP1). CP2 is estimated to generate \$104.4 million in direct personal income each year of construction from the 370 direct construction-related jobs that would be created. This amount of personal income is roughly a 1.4 percent increase in annual income in the local economic study area. In addition, indirect and induced personal income totaling \$47.6 million per year of construction is expected to be generated in various construction-related and other industries in the primary study area that would support construction under CP2.

Taken together, it is expected that direct, indirect, and induced personal income resulting from CP2 would be approximately \$152.0 million per year of construction within the local economic study. Direct, indirect, and induced annual personal income under CP2 would be less than CP1; however, this income would be generated over 48 months under CP2 (for a total of \$608.0 million), compared to 36 months under CP1 (for a total of \$550.7 million). This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-5 (CP2): Short-Term Increases in Sales and Profits for Businesses in the Primary Study Area that Support the Construction Industry Most of the construction materials used for CP2 are expected to be purchased within the primary study area. These purchases would provide the local economy with increased sales and profits over the 48-month construction period. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-5 (CP1). Because of the longer project duration and larger dam raise proposed under CP2, short-term increases in sales and profits for businesses in the primary study area would be larger than those under CP1. The size of these increases has not yet been quantified, but it is expected that the additional time and materials required to implement CP2 would generate more sales and profits than CP1 for construction-related and service-oriented businesses. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-6 (CP2): Short-Term Increase in State and Local Sales Tax Revenues in the Primary Study Area from Construction-Related Personal Income and Purchases As stated above, implementation of CP2 is expected to result in a substantial increase in total personal income (direct, indirect, and induced) over the 48-month construction period. This additional income, in combination with the construction-related purchases in the primary study area, would result in a substantial increase in local sales tax revenues from increased consumer spending in nearby cities and counties. Construction-related activities under CP2 would likely also result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. The exact amount of State and local sales tax revenue increases has not yet been calculated; however, this impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-6 (CP1). Because of the larger total personal income (direct, indirect, and induced) over the construction period expected to result from implementation of CP2, it is assumed that the short-term increase in local sales tax revenues generated by CP2 would be greater than that from CP1. Construction-related activities under CP2 are also expected to result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. These additional revenues would likely be cycled back to local government coffers through statewide programs and policies. The increases in State sales and income taxes are expected to be larger under CP2 than under CP1. All of these increases are expected to be more beneficial for the relevant local jurisdictions. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-7 (CP2): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Primary Study Area As a result of the added reservoir capacity created by CP2, the overall risk of flooding below Shasta Dam and its related consequences to the primary study area are expected to be reduced.

Although heavy-rain events would continue to occur in the region and locally, the project is intended to provide greater flexibility in flood control downstream because of the increased capacity of the reservoir. As a result, there would be less damage to existing structures and a smaller loss of potential future development; this, in turn, would reduce salary and wage losses for residents of the primary study area, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-7 (CP1). CP2 would increase the total storage capacity of Shasta Lake by 443,000 acre-feet. CP2 would therefore provide approximately 187,000 acre-feet more storage capacity in the reservoir than CP1. This additional capacity provided with the 12.5-foot dam raise would increase the flood control capabilities compared to both existing conditions and CP1 by further reducing the risk of flooding downstream from Shasta Dam. The overall risk of flooding and its associated adverse effects on property, housing, and businesses downstream from Shasta Dam and residents throughout the primary study area would therefore be further reduced.

The increased storage capacity proposed as a part of CP2 would also reduce the risk of job loss from flooding and its related effects to a greater extent than the capacity increase proposed under CP1. The increased storage capacity would further reduce the risk of flood-level conditions downstream from the dam. Related effects from flooding on the economic livelihood of residents of the primary study area would similarly be reduced.

Fewer flooding events would occur and less damage would be inflicted on property adjacent to downstream waterways during some flood events. This reduction in flood damage would also reduce residents' salary and wage losses resulting from these catastrophic events.

For the reasons described above, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-8 (CP2): Long-Term Increases in Direct Employment in the Primary Study Area Related to Project Operations In the long term, it is expected that implementation of CP2 would create at least two new maintenance-related positions for the Shasta Dam facilities. These two positions are expected to be permanent and would continue once the 48-month construction period is complete. This impact would be beneficial.

This impact would be the same as Impact Socio-8 (CP1) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Lower Sacramento River and Delta

Impact Socio-9 (CP2): Potential Temporary Increase in Indirect Employment in Construction-Related Businesses of the Lower Sacramento River and Delta

Construction activities associated with CP2 have the potential to result in a short-term increase in indirect employment within the lower Sacramento River and Delta portion of the extended study area. Depending on the location of construction material sourced outside of the primary study area, indirect increases in employment within construction-related businesses may result in the lower Sacramento River and Delta area. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-9 (CP1). A larger potential temporary increase in indirect employment in construction-related businesses of the lower Sacramento River and Delta area would be expected under CP2 than under CP1. Estimated total construction costs for CP2 are approximately 10.4 percent higher than costs for CP1. Therefore, it is expected more income would be allocated to indirect positions in construction-related businesses under CP2. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-10 (CP2): Short-Term Increases in Sales and Profits for Businesses in the Lower Sacramento River and Delta Area That Support the Construction Industry It is expected that a small amount of the construction materials used for CP2 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the lower Sacramento River and Delta area over the 48-month construction period of CP1. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-10 (CP1). Because of the longer project duration and larger dam raise proposed under CP2, short-term increases in sales and profits for construction-related businesses in the lower Sacramento River and Delta area are expected to be larger than those under CP1. The size of these increases has not yet been quantified, but because additional time and materials would be required, implementing CP2 would likely generate more sales and profits for construction-related and service-oriented businesses. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-11 (CP2): Short-Term Increase in State Sales and Income Tax Revenues in the Lower Sacramento River and Delta Area from Construction-Related Personal Income and Purchases In addition to local tax revenues, CP2 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-11 (CP1) because the construction period would be longer and more construction materials would be needed. The increased employment and personal incomes anticipated as a part of implementation of CP2 are expected to cause an increase in short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues would likely be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-12 (CP2): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Lower Sacramento River and Delta Area As a result of the added reservoir capacity under CP2, the overall risk of flooding and its related consequences below Shasta Dam is expected to be reduced. Although heavy-rain events would continue to occur in the region, CP2 is intended to provide greater flexibility in flood control in the lower Sacramento River and Delta area because of the increased capacity of the reservoir. As a result, less damage to existing structures and a smaller loss of potential future development would be expected; this, in turn, would reduce salary and wage losses for residents in or near the lower Sacramento River floodplain and the Delta resulting from these catastrophic events, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-12 (CP1). CP2 would provide approximately 187,000 acre-feet more storage capacity in the reservoir than CP1. This additional capacity would increase the flood control capabilities beyond the existing capabilities at Shasta Dam and the capabilities proposed under CP1, and would further reduce the risk of flooding downstream from the dam. The overall risk of flooding and its associated adverse effects on property, housing, businesses, and residents of the lower Sacramento River and Delta area would be reduced with implementation of CP2. Flood risk reduction effects identified earlier for CP1 would apply to CP2, but the positive effects would be greater because of the direct relationship between the proposed dam heights, corresponding capacity of the reservoir, and associated increase in flood control operations and management flexibility.

Increased storage capacity proposed as a part of CP2 would also reduce the risk of job loss from flooding and its related effects in the lower Sacramento River and Delta area, when compared to CP1. A reduction in the risk of flood-level conditions downstream from the dam would thus strengthen the economic livelihood of downstream residents in the lower Sacramento River and Delta area.

Fewer flooding events would occur and less damage would be inflicted on businesses located adjacent to downstream waterways during some flood

events. This reduction in flood damage would reduce residents' salary and wage losses resulting from these catastrophic events.

For the reasons described above, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CVP/SWP Service Areas

Impact Socio-13 (CP2): Short-Term Increases in Sales and Profits for Businesses in the CVP and SWP Service Areas That Support the Construction Industry A small amount of the construction materials used during construction under CP2 are expected to be purchased within the extended study area, including the CVP and SWP service areas. These purchases are predicted to increase sales and profits of businesses within the CVP and SWP service areas over the 48-month construction period of CP2. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-13 (CP1). Because of the longer project duration and larger dam raise proposed under CP2, short-term increases in sales and profits for construction-related businesses in the extended study area, including the CVP and SWP service areas, are expected to be larger than those for CP1. The size of these increases has not yet been quantified, but it is expected that the additional time and materials required to implement CP2 would generate more sales and profits for construction-related and service-oriented businesses. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-14 (CP2): Potential Temporary Reduction in Shasta Project Water or Hydropower Supplied to the CVP and SWP Service Areas During Construction Implementation of CP2 may require temporarily reducing the reservoir level either throughout the 48-month project duration or at critical times. This reduction in the reservoir level could temporarily reduce the amount of water or hydropower available from the dam and related hydropower infrastructure. Should this occur, sources of replacement water or hydropower would need to be secured. If these replacement resources were substantially more expensive, a minor negative effect on water or power customers may result. This impact would be potentially significant.

This impact is similar to Impact Socio-14 (CP1), except that the project construction period would be longer and reductions in reservoir levels could last longer under CP2. This impact would be potentially significant. Mitigation for this impact is proposed in Section 16.3.5.

Impact Socio-15 (CP2): Short-Term Increase in State Sales and Income Tax Revenues in the CVP and SWP Service Areas from Construction-Related Personal Income and Purchases In addition to local tax revenue, CP2 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the CVP and SWP service

areas. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-15 (CP1). Short-term increases in State sales and income taxes are expected to be larger under CP2 than under CP1. All of these increases are expected to be more beneficial for the relevant local jurisdictions. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-16 (CP2): Long-Term Increase in Agricultural Income and Jobs in the CVP and SWP Service Areas as a Result of Improved Water Availability and Reliability Based on CVPM modeling, improved water availability and reliability expected to result from implementation of CP2 would substantially increase agricultural net income in the CVP and SWP service areas and increase the number of agricultural positions in these areas. This increase in production and jobs would contribute substantially to the continuation of this already strong industry in California. This impact would be beneficial.

This impact is similar to Impact Socio-16 (CP1). Because of the increase in the availability and reliability of water associated with implementation of CP2, the long-term increase in indirect employment within the agricultural sector is expected to be larger than under CP1. Based on the outputs of CVPM modeling, CP2 is estimated to generate an additional \$11.5 million in net income during dry years and \$7.1 million in average years, when compared to existing conditions. In wet years, net income is projected to decrease slightly (\$200,000). This overall increase in net income is expected to stimulate more employment opportunities in the agricultural sector to support the higher crop production that would likely be the result of additional irrigation deliveries under CP2 (compared to CP1). This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-17 (CP2): Reduction in Risk of Potential Water and Power Shortages (and Related Economic Activity) in the CVP and SWP Service Areas as a Result of Long-Term Improvements to Water and Power Supply Reliability Implementation of CP2 would substantially increase Shasta Dam's storage capacity. As stated in Impact Socio-16 (CP2), this additional storage capacity would improve the long-term availability and reliability of water in the CVP and SWP service areas. Beyond increasing agricultural production, this improved availability and reliability would reduce the long-term risk of urban water and power shortages, and their related adverse economic consequences, in the future. This impact would be beneficial.

This impact would be the similar to Impact Socio-17 (CP1) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply

CP3 would increase the full pool capacity of Shasta Lake to 5,186 TAF and increase the surface area of the pool to 32,100 acres. It is expected that implementing CP3 would result in the replacement or modification of eight bridges and relocation of approximately 130 existing structures. The total construction cost associated with CP3 would be approximately \$1,064 million and the annual operational cost would be \$53.7 million. This alternative would generate approximately \$26.7 million in annual water supply reliability benefits and \$25.0 million average annual equivalent anadromous fish restoration benefits. CP3 would increase hydropower generation by approximately 96 GWh per year, equivalent to approximately \$5.4 million in hydropower benefits.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Socio-1 (CP3): Short-Term Increase in Population and Housing Demand in the Primary Study Area Resulting from Construction-Related Activities According to Reclamation estimates, approximately 350 new direct jobs would be created as a result of construction activities associated with CP3. All 350 construction workers are expected to come from the local labor force; therefore, a short-term population increase is not expected. This impact would be less than significant.

This impact is similar to Impacts Socio-1 (CP1) and Socio-1 (CP2). CP3 would add 191,000 acre-feet of storage capacity beyond the capacity anticipated in CP2, for a total increase of 634,000 acre-feet. As with the other two dam raise alternatives, approximately 350 new construction workers would be needed to complete the 18.5-foot raise proposed in CP3. Approximately 60 months of work (compared to the 48 months proposed under CP2) would be required to complete the construction activities proposed under CP3. Workers for this effort would also come from the local labor pool. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-2 (CP3): Short-Term Increases in Direct, Indirect, and Induced Employment in the Primary Study Area Related to Construction Activities

Construction activities associated with CP3 are assumed to generate approximately 350 new direct construction jobs, 450 indirect jobs in various construction-related support industries, and 610 induced jobs because of increased household spending in the primary study area. Individuals to fill these jobs are expected to be drawn from the local community. These new jobs are expected to provide important but temporary employment opportunities to many unemployed construction workers in the primary study area. This impact would be beneficial.

This impact is similar to Impact Socio-2 (CP1) and Socio-2 (CP2). Under CP3, approximately 350 new short-term, direct construction jobs would be created, in addition to 450 indirect jobs expected to be created in various construction-related support industries, and 610 induced jobs created because of increased

household spending near the project area. Total direct, indirect, and induced employment under CP3 would be less than CP1 and CP2; however, these positions would last approximately 60 months under CP3, compared to 36 months under CP1 and 48 months under CP2. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-3 (CP3): Potential for Temporary Reduction in the Labor Force of Related Industrial Sectors in the Primary Study Area as a Result of Direct Construction-Related Employment With the creation of 350 new construction jobs resulting from CP3, the potential exists for workers from other industries to move to jobs related to construction at Shasta Dam. Given the size of the construction industry in the primary study area, and the high unemployment rate in the area, this impact would be less than significant.

This impact would be similar to Impacts Socio-3 (CP1) and Socio-3 (CP2) and would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-4 (CP3): Short-Term Increases in Direct, Indirect, and Induced Personal Income Paid to Employees in the Primary Study Area Hired for Construction-Related Activities Based on calculations completed as a part of Reclamation's IMPLAN socioeconomic model process, it is estimated that more than \$97.3 million in personal income would be directly paid to employees in the primary study area each year of the 60 month construction period under CP3. This amount of personal income is a more than 1.3 percent increase in income in the local economic study area. In addition, more than \$44.3 million in indirect and induced income is expected to be generated in various construction-related and other industries in the primary study area each year of construction under CP3. This impact would be beneficial.

This impact is similar to Impacts Socio-4 (CP1) and Socio-4 (CP2). CP3 is estimated to generate \$97.3 million in direct personal income each year of construction from the 350 direct construction-related jobs that would be created. This amount of personal income is roughly a 1.3 percent increase in annual income in the local economic study area. In addition, indirect and induced personal income totaling \$44.3 million per year of construction is expected to be generated in various construction-related and other industries in the primary study area that would support construction under CP3.

Taken together, it is expected that direct, indirect, and induced personal income resulting from CP3 would be approximately \$141.7 million per year of construction within the local economic study. Direct, indirect, and induced annual personal income under CP3 would be less than CP1 and CP2; however, this income would be generated over 60 months under CP2 (for a total of \$708.4 million), compared to 36 months under CP1 (for a total of \$550.7 million) and to 48 months under CP2 (for a total of \$608.0 million). This impact

would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-5 (CP3): Short-Term Increases in Sales and Profits for Businesses in the Primary Study Area that Support the Construction Industry Most of the construction materials used for CP3 are expected to be purchased within the primary study area. These purchases would provide the local economy with increased sales and profits over the 60-month construction period. This impact would be beneficial.

This impact is similar to but more beneficial than Impacts Socio-5 (CP1) and Socio-5 (CP2). CP3 would require the largest dam height increase and therefore the greatest construction expenditures over the total construction period. As a result, CP3 is expected to generate more business sales and profits than CP1 and CP2 in construction-related and service-oriented businesses in the primary study area. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-6 (CP3): Short-Term Increase in State and Local Sales Tax Revenues in the Primary Study Area from Construction-Related Personal Income and Purchases As stated above, implementation of CP3 is expected to result in a substantial increase in total personal income (direct, indirect, and induced) over the 60-month construction period. This additional income, in combination with the construction-related purchases in the primary study area, would result in a substantial increase in local sales tax revenues from increased consumer spending in nearby cities and counties. Construction-related activities under CP3 would likely also result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. The exact amount of State and local sales tax revenue increases has not yet been calculated; however, this impact would be beneficial.

This impact is similar to but more beneficial than Impacts Socio-6 (CP1) and Socio-6 (CP2). CP3 is estimated to generate more direct personal income than CP1 and CP2. This larger amount of personal income generated is expected to result in more local sales tax revenues in the primary study area than under the other two alternatives. Construction-related activities under CP3 are also expected to result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. These additional revenues would likely be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-7 (CP3): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Primary Study Area As a result of the added reservoir capacity created by CP3, the overall risk of flooding and its related consequences below Shasta Dam are expected to be reduced. Although heavy-rain events would continue to occur in the region and locally, the project is

intended to provide greater flexibility in flood control downstream because of the increased capacity of the reservoir. As a result, there would be less damage to existing structures and a smaller loss of potential future development; this, in turn, would reduce salary and wage losses for residents of the primary study area, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact is similar to but more beneficial than Impacts Socio-7 (CP1) and Socio-7 (CP2). CP3 would create 634,000 acre-feet more storage capacity than current capacity, more than 40 percent more than would be provided by CP2. CP3 would therefore provide substantially more flood protection than either CP1 or CP2. As a result, CP3 would result in a greater reduction than CP1 and CP2 in the risk of damage to property and structures from flooding along the upper Sacramento River.

The increased storage capacity proposed as a part of CP3 would result in a larger decrease in the risk of job loss from flooding and its related effects than would occur under CP1 or CP2. CP3 would increase storage space in Shasta Lake and provide approximately 191,000 more acre-feet of storage than either of the two previous alternatives. The increased storage capacity would create a greater reduction in the risk of flood-level conditions downstream from the dam. Related effects from flooding on the economic livelihood of residents of the primary study area would similarly be reduced. In addition, the reduction in flood damage would reduce residents' salary and wage losses resulting from these catastrophic events.

For the reasons described above, this impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-8 (CP3): Long-Term Increases in Direct Employment in the Primary Study Area Related to Project Operations In the long term, it is expected that implementation of CP3 would create at least two new maintenance-related positions for the Shasta Dam facilities. These two positions are expected to be permanent and would continue once the 60-month construction period is complete. This impact would be beneficial.

This impact would be the same as Impacts Socio-8 (CP1) and Socio-8 (CP2) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Lower Sacramento River and Delta

Impact Socio-9 (CP3): Potential Temporary Increase in Indirect Employment in Construction-Related Businesses of the Lower Sacramento River and Delta Construction activities associated with CP3 have the potential to result in a short-term increase in indirect employment within the lower Sacramento River and Delta portion of the extended study area. Depending on the location of construction materials sourced outside of the primary study area, indirect

increases in employment within construction-related businesses may result in the lower Sacramento River and Delta area. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-9 (CP2). A larger potential temporary increase in indirect employment in construction-related businesses of the lower Sacramento River and Delta area would be expected under CP3. Estimated total construction costs for CP3 are approximately 16.5 percent higher than costs for CP2. Therefore, it is expected more income would be allocated to indirect positions in construction-related businesses would be expected under CP3. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-10 (CP3): Short-Term Increases in Sales and Profits for Businesses in the Lower Sacramento River and Delta Area That Support the Construction Industry It is expected that a small amount of the construction materials used for CP3 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the lower Sacramento River and Delta area over the 60-month construction period of CP3. This impact would be beneficial.

This impact is similar to but more beneficial than Impacts Socio-10 (CP1) and Socio-1 (CP2). Because of the longer project duration and greater construction expenditures associated with the larger dam raise proposed under CP3, short-term increases in sales and profits for construction-related businesses in the lower Sacramento River and Delta area are expected to be larger than those CP2. The size of these increases has not yet been quantified, but it is expected that because additional time and materials would be required, implementing CP3 would generate more sales and profits for construction-related and service-oriented businesses. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-11 (CP3): Short-Term Increase in State Sales and Income Tax Revenues in the Lower Sacramento River and Delta Area from Construction-Related Personal Income and Purchases In addition to local tax revenues, CP3 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact is similar to but more beneficial than Impacts Socio-11 (CP1) and Socio-11 (CP2) because the construction period would be longer and more construction materials would be needed. The increased employment and personal incomes anticipated as a part of implementation of CP3 are expected to cause an increase in short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues would

likely be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-12 (CP3): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Lower Sacramento River and Delta Area As a result of the added reservoir capacity under CP3, the overall risk of flooding and its related consequences below Shasta Dam is expected to be reduced. Although heavy-rain events would continue to occur in the region, CP3 is intended to provide greater flexibility in flood control in the lower Sacramento River and Delta area because of the increased capacity of the reservoir. As a result, less damage to existing structures and a smaller loss of potential future development would be expected; this, in turn, would reduce salary and wage losses for residents in and near the lower Sacramento River floodplain and the Delta resulting from these catastrophic events, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-12 (CP2). CP3 would provide approximately 191,000 acre-feet more storage capacity in the reservoir than CP2. This additional capacity would increase the flood control capabilities beyond the existing capabilities at Shasta Dam and the capabilities proposed under CP2, and would further reduce the risk of flooding downstream from the dam. The overall risk of flooding and its associated adverse effects on property, housing, businesses, and residents of the lower Sacramento River and Delta area would be reduced with implementation of CP3. Flood risk reduction effects identified earlier for CP2 would apply to CP3, but the positive effects would be greater because of the direct relationship between the proposed dam heights, corresponding capacity of the reservoir, and associated increase in flood control operations and management flexibility.

Increased storage capacity proposed as a part of CP3 would also reduce the risk of job loss from flooding and its related effects in the lower Sacramento River and Delta, when compared to CP2. A reduction in the risk of flood-level conditions downstream from the dam would thus strengthen the economic livelihood of downstream residents in the lower Sacramento River and Delta portion of the extended study area. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CVP/SWP Service Areas

Impact Socio-13 (CP3): Short-Term Increases in Sales and Profits for Businesses in the CVP and SWP Service Areas That Support the Construction Industry A small amount of the construction materials used during construction under CP3 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the CVP and SWP service areas over the 60-month construction period of CP3. This impact would be beneficial.

This impact is similar to but more beneficial than Impacts Socio-13 (CP1) and Socio-13 (CP2) because the construction period would be longer and more construction materials would be needed. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-14 (CP3): Potential Temporary Reduction in Shasta Project Water or Hydropower Supplied to the CVP and SWP Service Areas During Construction Implementation of CP3 may require temporarily reducing the reservoir level either throughout the 60-month construction period or at critical times. This reduction in the reservoir level could temporarily reduce the amount of water or hydropower available from the dam and related hydropower infrastructure. Should this occur, sources of replacement water or hydropower would need to be secured. If these replacement resources were substantially more expensive, a minor negative effect on water or power customers may result. This impact would be potentially significant.

This impact is similar to Impacts Socio-14 (CP1) and Socio-14 (CP2), except that the project construction period would be longer. This impact would be potentially significant. Mitigation for this impact is proposed in Section 16.3.5.

Impact Socio-15 (CP3): Short-Term Increase in State Sales and Income Tax Revenues in the CVP and SWP Service Areas from Construction-Related Personal Income and Purchases In addition to local tax revenue, CP3 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the CVP and SWP service areas. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact is similar to but more beneficial than Impact Socio-15 (CP2). Short-term increases in State sales and income taxes are expected to be larger under CP3 than under CP2. All of these increases are expected to be more beneficial for the relevant local jurisdictions. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-16 (CP3): Long-Term Increase in Agricultural Income and Jobs in the CVP and SWP Service Areas as a Result of Improved Water Availability and Reliability Based on CVPM modeling, improved water availability and reliability expected to result from implementation of CP3 would substantially increase agricultural net income in the CVP and SWP service areas and increase the number of agricultural positions in these areas. This increase in production and jobs would contribute substantially to the continuation of this already strong industry in California. This impact would be beneficial.

This impact is similar to Impacts Socio-16 (CP1) and Socio-16 (CP2). Because of the increase in the availability and reliability of water associated with implementation of CP3, the long-term increase in indirect employment within

the agricultural sector is expected to be larger than under CP1 and CP2 (6.5-foot and 12.5-foot dam raise, respectively). Based on the outputs of CVPM modeling, CP3 is estimated to generate an additional \$15.3 million in net income during dry years and \$6.8 million in average years, when compared to existing conditions. In wet years, CP3 is expected to produce a \$700,000 increase in net income. This increase is in contrast to the loss in net income projected for CP1 and CP2. The projected increase in net income under CP3 is expected to stimulate a greater number of employment opportunities in the agricultural sector than under CP1 and CP2, because this alternative would likely generate higher crop production. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-17 (CP3): Reduction in Risk of Potential Water and Power Shortages (and Related Economic Activity) in the CVP and SWP Service Areas as a Result of Long-Term Improvements to Water and Power Supply Reliability
Implementation of CP3 would substantially increase Shasta Dam's storage capacity. As stated in Impact Socio-16 (CP3), this additional storage capacity would improve long-term water availability and reliability in the CVP and SWP service areas. Beyond increasing agricultural production, this improved availability and reliability would reduce the long-term risk of urban water and power shortages, and their related adverse economic consequences, in the future. This impact would be beneficial.

This impact would be the similar to the other CPs and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

CP4 would increase the full pool capacity of Shasta Lake to 5,186 TAF and increase the surface area of the pool to 32,100 acres. It is expected that implementing CP4 would result in the replacement or modification of eight bridges and relocation of approximately 130 existing structures. The total construction cost associated with CP4 would be approximately \$1,070 million and the annual operational cost would be \$54.0 million. This alternative would generate approximately \$27.0 million in annual water supply reliability benefits and \$49.2 million average annual equivalent anadromous fish restoration benefits. CP4 would generate approximately 138 GWh per year, equivalent to approximately \$7.6 million in hydropower benefits.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Socio-1 (CP4): Short-Term Increase in Population and Housing Demand in the Primary Study Area Resulting from Construction-Related Activities
According to Reclamation estimates, approximately 350 new direct jobs would be created as a result of construction activities associated with CP4. All 350 construction workers are expected to come from the local labor force;

therefore, a short-term population increase is not expected. This impact would be less than significant.

This impact would be the same as Impact Socio-1 (CP3) and would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-2 (CP4): Short-Term Increases in Direct, Indirect, and Induced Employment in the Primary Study Area Related to Construction Activities

Construction activities associated with CP4 are assumed to generate approximately 350 new construction jobs, 450 indirect jobs in various construction-related support industries, and 610 induced jobs because of increased household spending in the primary study area. Individuals to fill these jobs are expected to be drawn from the local community. These new jobs are expected to provide important but temporary employment opportunities to many unemployed construction workers in the primary study area. This impact would be beneficial.

This impact would be the same as Impact Socio-2 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-3 (CP4): Potential for Temporary Reduction in the Labor Force of Related Industrial Sectors in the Primary Study Area as a Result of Direct Construction-Related Employment

With the creation of 350 new construction jobs resulting from CP4, the potential exists for workers from other industries to move to jobs related to construction at Shasta Dam. Given the size of the construction industry in the primary study area, and the high unemployment rate in the area, this impact would be less than significant.

This impact would be the same as Impact Socio-3 (CP3) and would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-4 (CP4): Short-Term Increases in Direct, Indirect, and Induced Personal Income Paid to Employees in the Primary Study Area Hired for Construction-Related Activities

Construction activities for CP4 would last 60 months, compared to 36 and 48 months for CP1 and CP2, respectively (but gravel augmentation would continue for 120 months). Based on calculations completed as a part of Reclamation's IMPLAN socioeconomic model process, it is estimated that more than \$97.9 million in personal income would be directly paid to employees in the primary study area each year of construction. This amount of personal income is a more than 1.3 percent increase in income in the local economic study area. In addition, more than \$44.5 million in indirect and induced income is expected to be generated in various construction-related and other industries in the primary study area each year of construction under CP4. This impact would be beneficial.

This impact would be very similar to Impact Socio-4 (CP3), varying only with relatively minor construction activities associated with downstream restoration,

and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-5 (CP4): Short-Term Increases in Sales and Profits for Businesses in the Primary Study Area that Support the Construction Industry Most of the construction materials used for CP4 are expected to be purchased within the primary study area. These purchases would provide the local economy with increased sales and profits over the 60-month construction period. This impact would be beneficial.

This impact would be very similar to Impact Socio-5 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-6 (CP4): Short-Term Increase in State and Local Sales Tax Revenues in the Primary Study Area from Construction-Related Personal Income and Purchases As stated above, implementation of CP4 is expected to result in a substantial increase in total personal income (direct, indirect, and induced) over the 60-month construction period. This additional income, in combination with the construction-related purchases in the primary study area, would result in a substantial increase in local sales tax revenues from increased consumer spending in nearby cities and counties. Construction-related activities under CP4 would likely also result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. The exact amount of State and local sales tax revenue increases has not yet been calculated; however, this impact would be beneficial.

This impact would be very similar to Impact Socio-6 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-7 (CP4): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Primary Study Area As a result of the added reservoir capacity created by CP4, the overall risk of flooding and its related consequences below Shasta Dam are expected to be reduced. Although heavy-rain events would continue to occur in the region and locally, the project is intended to provide greater flexibility in flood control downstream because of the increased capacity of the reservoir. As a result, there would be less damage to existing structures and a smaller loss of potential future development; this, in turn, would reduce salary and wage losses for residents of the primary study area, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact would be the same as Impact Socio-7 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-8 (CP4): Long-Term Increases in Direct Employment in the Primary Study Area Related to Project Operations In the long term, it is expected that implementation of CP4 would create at least two new

maintenance-related positions for the Shasta Dam facilities. These two positions are expected to be permanent and would continue once the 60-month construction period is complete. This impact would be beneficial.

This impact would be the same as Impact Socio-8 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Lower Sacramento River and Delta

Impact Socio-9 (CP4): Potential Temporary Increase in Indirect Employment in Construction-Related Businesses of the Lower Sacramento River and Delta

Construction activities associated with CP4 have the potential to result in a short-term increase in indirect employment within the lower Sacramento River and Delta portion of the extended study area. Depending on the location of construction material sourced outside of the primary study area, indirect increases in employment within construction-related businesses may result in the lower Sacramento River and Delta area. This impact would be beneficial.

This impact would be very similar to Impact Socio-9 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-10 (CP4): Short-Term Increases in Sales and Profits for Businesses in the Lower Sacramento River and Delta Area That Support the Construction Industry It is expected that a small amount of the construction materials used for CP4 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the lower Sacramento River and Delta area over the 60-month construction period of CP4. This impact would be beneficial.

This impact would be very similar to Impact Socio-10 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-11 (CP4): Short-Term Increase in State Sales and Income Tax Revenues in the Lower Sacramento River and Delta Area from Construction-Related Personal Income and Purchases In addition to local tax revenues, CP4 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact would be very similar to Impact Socio-11 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-12 (CP4): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Lower Sacramento River and Delta Area As a result of the added reservoir capacity under CP4, the overall risk of flooding and its related consequences below Shasta Dam is expected to be reduced. Although heavy-rain events would continue to occur in the region, CP4 is intended to provide

greater flexibility in flood control in the lower Sacramento River and Delta area because of the increased capacity of the reservoir. As a result, less damage to existing structures and a smaller loss of potential future development would be expected; this, in turn, would reduce salary and wage losses for residents in and near the lower Sacramento River floodplain and the Delta resulting from these catastrophic events, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact would be the same as Impact Socio-12 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CVP/SWP Service Areas

Impact Socio-13 (CP4): Short-Term Increases in Sales and Profits for Businesses in the CVP and SWP Service Areas That Support the Construction Industry A small amount of the construction materials used during construction under CP4 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the CVP and SWP service areas over the 60-month construction period of CP4. This impact would be beneficial.

This impact would be very similar to Impact Socio-13 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-14 (CP4): Potential Temporary Reduction in Shasta Project Water or Hydropower Supplied to the CVP and SWP Service Areas During Construction Implementation of CP4 may require temporarily reducing the reservoir level either throughout the 60-month project duration or at critical times. This reduction in the reservoir level could temporarily reduce the amount of water or hydropower available from the dam and related hydropower infrastructure. Should this occur, sources of replacement water or hydropower would need to be secured. If these replacement resources were substantially more expensive, a minor negative effect on water or power customers may result. This impact would be potentially significant.

This impact is similar to Impact Socio-14 (CP3), except that the project construction period would be longer. This impact would be potentially significant. Mitigation for this impact is proposed in Section 16.3.5.

Impact Socio-15 (CP4): Short-Term Increase in State Sales and Income Tax Revenues in the CVP and SWP Service Areas from Construction-Related Personal Income and Purchases In addition to local tax revenue, CP4 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the CVP and SWP service areas. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact would be very similar to Impact Socio-15 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-16 (CP4): Long-Term Increase in Agricultural Income and Jobs within the CVP and SWP Service Areas as a Result of Improved Water Availability and Reliability Based on CVPM modeling, improved water availability and reliability expected to result from implementation of CP4 would substantially increase agricultural net income in the CVP and SWP service areas. This increase in production would contribute substantially to the continuation of this already strong industry in California. This impact would be beneficial.

This impact would be the same as Impact Socio-16 (CP1) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-17 (CP4): Reduction in Risk of Potential Water and Power Shortages (and Related Economic Activity) in the CVP and SWP Service Areas as a Result of Long-Term Improvements to Water and Power Supply Reliability Implementation of CP4 would substantially increase Shasta Dam's storage capacity. As stated in Impact Socio-16 (CP4), this additional storage capacity would improve long-term water availability and reliability in the CVP and SWP service areas. Beyond increasing agricultural production, this improved availability and reliability would reduce the long-term risk of urban water and power shortages, and their related adverse economic consequences, in the future. This impact would be beneficial.

This impact would be the similar to the other CPs and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CP5 – 18.5-Foot Dam Raise, Combination Plan

CP5 would increase the full pool capacity of Shasta Lake to 5,186 TAF and increase the surface area of the pool to 32,100 acres. It is expected that implementing CP5 would result in the replacement or modification of eight bridges and relocation of approximately 130 existing structures. The total construction cost associated with CP5 would be approximately \$1,073 million and the annual operational cost would be \$54.1 million. This alternative would generate approximately \$26.7 million in annual water supply reliability benefits and \$25.0 million average annual equivalent anadromous fish restoration benefits. CP5 would generate approximately 96 GWh per year, equivalent to approximately \$5.4 million in hydropower benefits.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Socio-1 (CP5): Short-Term Increase in Population and Housing Demand in the Primary Study Area Resulting from Construction-Related Activities According to Reclamation estimates, approximately 350 new direct jobs would be created as a result of construction activities associated with CP5.

All 350 construction workers are expected to come from the local labor force; therefore, a short-term population increase is not expected. This impact would be less than significant.

This impact would be the same as Impact Socio-1 (CP3) and would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-2 (CP5): Short-Term Increases in Direct, Indirect, and Induced Employment in the Primary Study Area Related to Construction Activities

Construction activities associated with CP5 are assumed to generate approximately 350 new direct construction jobs, 450 indirect jobs in various construction-related support industries, and 620 induced jobs because of increased household spending in the primary study area. Individuals to fill these jobs are expected to be drawn from the local community. These new jobs are expected to provide important but temporary employment opportunities to many unemployed construction workers in the primary study area. This impact would be beneficial.

This impact would be very similar to Impact Socio-2 (CP3), varying only with relatively minor construction activities associated with shoreline and tributary restoration, and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-3 (CP5): Potential for Temporary Reduction in the Labor Force of Related Industrial Sectors in the Primary Study Area as a Result of Direct Construction-Related Employment With the creation of 350 new construction jobs resulting from CP5, the potential exists for workers from other industries to move to jobs related to construction at Shasta Dam. Given the size of the construction industry in the primary study area, and the high unemployment rate in the area, this impact would be less than significant.

This impact would be the same as Impact Socio-3 (CP3) and would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-4 (CP5): Short-Term Increases in Direct, Indirect, and Induced Personal Income Paid to Employees in the Primary Study Area Hired for Construction-Related Activities Construction activities for CP5 would last 60 months, compared to 36 and 48 months for CP1 and CP2, respectively. (Gravel augmentation activities would last 120 months, however.) Based on calculations completed as a part of Reclamation's IMPLAN socioeconomic model process, it is estimated that more than \$98.2 million in personal income would be directly paid to employees in the primary study area each year of construction. This amount of personal income is a more than 1.3 percent increase in income in the local economic study area. In addition, more than \$44.7 million in indirect and induced income is expected to be generated in various construction-related and other industries in the primary study area each year of construction under CP5. This impact would be beneficial.

This impact would be very similar to Impact Socio-4 (CP3), varying only with relatively minor construction activities associated with downstream, shoreline, and tributary restoration, and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-5 (CP5): Short-Term Increases in Sales and Profits for Businesses in the Primary Study Area that Support the Construction Industry Most of the construction materials used for CP5 are expected to be purchased within the primary study area. These purchases would provide the local economy with increased sales and profits over the 60-month construction period. This impact would be beneficial.

This impact would be very similar to Impact Socio-5 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-6 (CP5): Short-Term Increase in State and Local Sales Tax Revenues in the Primary Study Area from Construction-Related Personal Income and Purchases As stated above, implementation of CP5 is expected to result in a substantial increase in total personal income (direct, indirect, and induced) over the 60-month construction period. This additional income, in combination with the construction-related purchases in the primary study area, would result in a substantial increase in local sales tax revenues from increased consumer spending in nearby cities and counties. Construction-related activities under CP5 would likely also result in a temporary increase in State sales and income tax revenues received from businesses and residents of the primary study area. The exact amount of State and local sales tax revenue increases has not yet been calculated; however, this impact would be beneficial.

This impact would be very similar to Impact Socio-6 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-7 (CP5): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Primary Study Area As a result of the added reservoir capacity created by CP5, the overall risk of flooding and its related consequences below Shasta Dam are expected to be reduced. Although heavy-rain events would continue to occur in the region and locally, the project is intended to provide greater flexibility in flood control downstream because of the increased capacity of the reservoir. As a result, there would be less damage to existing structures and a smaller loss of potential future development; this, in turn, would reduce salary and wage losses for residents of the primary study area, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact would be the same as Impact Socio-7 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-8 (CP5): Long-Term Increases in Direct Employment in the Primary Study Area Related to Project Operations In the long term, it is expected that implementation of CP5 would create at least two new maintenance-related positions for the Shasta Dam facilities. These two positions are expected to be permanent and would continue once the 60-month construction period is complete. This impact would be beneficial.

This impact would be the same as Impact Socio-8 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Lower Sacramento River and Delta

Impact Socio-9 (CP5): Potential Temporary Increase in Indirect Employment in Construction-Related Businesses of the Lower Sacramento River and Delta Construction activities associated with CP5 have the potential to result in a short-term increase in indirect employment within the lower Sacramento River and Delta portion of the extended study area. Depending on the location of construction materials sourced outside of the primary study area, indirect increases in employment within construction-related businesses may result in the lower Sacramento River and Delta area. This impact would be beneficial.

This impact would be very similar to Impact Socio-9 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-10 (CP5): Short-Term Increases in Sales and Profits for Businesses in the Lower Sacramento River and Delta Area That Support the Construction Industry It is expected that a small amount of the construction materials used for CP5 are expected to be purchased within the extended study area. These purchases are predicted to increase sales and profits of businesses within the lower Sacramento River and Delta area over the 60-month construction period of CP5. This impact would be beneficial.

This impact would be very similar to Impact Socio-10 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-11 (CP5): Short-Term Increase in State Sales and Income Tax Revenues in the Lower Sacramento River and Delta Area from Construction-Related Personal Income and Purchases In addition to local tax revenues, CP5 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the lower Sacramento River and Delta portion of the extended study area. These additional revenues are expected to be cycled back to local government coffers through statewide programs and policies. This impact would be beneficial.

This impact would be very similar to Impact Socio-11 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-12 (CP5): Long-Term Reduction in the Adverse Economic Effects of Flooding in the Lower Sacramento River and Delta Area As a result of the

added reservoir capacity under CP5, the overall risk of flooding and its related consequences below Shasta Dam is expected to be reduced. Although heavy-rain events would continue to occur in the region, CP5 is intended to provide greater flexibility in flood control in the lower Sacramento River and Delta area because of the increased capacity of the reservoir. As a result, less damage to existing structures and a smaller loss of potential future development would be expected; this, in turn, would reduce salary and wage losses for residents in and near the lower Sacramento River floodplain and the Delta resulting from these catastrophic events, as well as business and personal income losses from such damage. Therefore, this impact would be beneficial.

This impact would be the same as Impact Socio-12 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

CVP/SWP Service Areas

Impact Socio-13 (CP5): Short-Term Increases in Sales and Profits for Businesses in the CVP and SWP Service Areas That Support the Construction Industry A small amount of the construction materials used during construction under CP5 are expected to be purchased within the extended study area, including the CVP and SWP service areas. These purchases are predicted to increase sales and profits of businesses within the CVP and SWP service areas over the 60-month construction period of CP5. This impact would be beneficial.

This impact would be very similar to Impact Socio-13 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-14 (CP5): Potential Temporary Reduction in Shasta Project Water or Hydropower Supplied to the CVP and SWP Service Areas During Construction Implementation of CP5 may require temporarily reducing the reservoir level either throughout the 60-month project duration or at critical times. This reduction in the reservoir level could temporarily reduce the amount of water or hydropower available from the dam and related hydropower infrastructure. Should this occur, sources of replacement water or hydropower would need to be secured. If these replacement resources were substantially more expensive, a minor negative effect on water or power customers may result. This impact would be potentially significant.

This impact would be the same as Impact Socio-14 (CP3) and would be potentially significant. Mitigation for this impact is proposed in Section 16.3.5.

Impact Socio-15 (CP5): Short-Term Increase in State Sales and Income Tax Revenues in the CVP and SWP Service Areas from Construction-Related Personal Income and Purchases In addition to local tax revenue, CP5 is expected to increase short-term construction-related State sales and income tax revenues received from businesses and residents of the CVP and SWP service areas. These additional revenues are expected to be cycled back to local

government coffers through statewide programs and policies. This impact would be beneficial.

This impact would be very similar to Impact Socio-15 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-16 (CP5): Long-Term Increase in Agricultural Income and Jobs in the CVP and SWP Service Areas as a Result of Improved Water Availability and Reliability Based on CVPM modeling, improved water availability and reliability expected to result from implementation of CP5 would substantially increase agricultural net income in the CVP and SWP service areas. This increase in production would contribute substantially to the continuation of this already strong industry in California. This impact would be beneficial.

This impact would be the same as Impact Socio-16 (CP3) and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Socio-17 (CP5): Reduction in Risk of Potential Water and Power Shortages (and Related Economic Activity) in the CVP and SWP Service Areas as a Result of Long-Term Improvements to Water and Power Supply Reliability Implementation of CP5 would substantially increase Shasta Dam's storage capacity. As stated in Impact Socio-16 (CP5), this additional storage capacity would improve long-term water availability and reliability in the CVP and SWP service areas. Beyond increasing agricultural production, this improved availability and reliability would reduce the long-term risk of urban water and power shortages, and their related adverse economic consequences, in the future. This impact would be beneficial.

This impact would be the similar to the other CPs and would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

16.3.5 Mitigation Measures

Table 16-1 presents a summary of mitigation measures for socioeconomics, population, and housing.

Table 16-1. Summary of Mitigation Measures for Socioeconomics, Population, and Housing

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Socio-1 (No-Action): Potential for Reduced Employment Opportunities for Lower Sacramento River and Delta Area Residents	LOS before Mitigation	PS	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	PS	LTS	LTS	LTS	LTS	LTS
Impact Socio-2 (No-Action): Potential for Temporary Disruptions in Business and Industrial Activity in the Lower Sacramento River and Delta Area	LOS before Mitigation	PS	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	PS	B	B	B	B	B
Impact Socio-3 (No-Action): Potential for Reduced Employment Opportunities for Residents Within the CVP and SWP Service Areas	LOS before Mitigation	PS	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	PS	LTS	LTS	LTS	LTS	LTS
Impact Socio-4 (No-Action): Potential for Temporary Disruptions in Business and Industrial Activity in the CVP and SWP Service Areas	LOS before Mitigation	PS	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	PS	B	B	B	B	B

Table 16-1. Summary of Mitigation Measures for Socioeconomics, Population, and Housing (contd.)

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Socio-5: Short-Term Increases in Sales and Profits for Businesses in the Primary Study Area that Support the Construction Industry	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-6: Short-Term Increase in State and Local Sales Tax Revenues in the Primary Study Area from Construction-Related Personal Income and Purchases	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-7: Long-Term Reduction in the Adverse Economic Effects of Flooding in the Primary Study Area	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-8: Long-Term Increases in Direct Employment in the Primary Study Area Related to Project Operations	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-9: Potential Temporary Increase in Indirect Employment in Construction-Related Businesses of the Lower Sacramento River and Delta	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-10: Short-Term Increases in Sales and Profits for Businesses in the Lower Sacramento River and Delta Area That Support the Construction Industry	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-11: Short-Term Increase in State Sales and Income Tax Revenues in the Lower Sacramento River and Delta Area from Construction-Related Personal Income and Purchases	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-12: Long-Term Reduction in the Adverse Economic Effects of Flooding in the Lower Sacramento River and Delta Area	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-13: Short-Term Increases in Sales and Profits for Businesses in the CVP and SWP Service Areas That Support the Construction Industry	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B

Table 16-1. Summary of Mitigation Measures for Socioeconomics, Population, and Housing (contd.)

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Socio-14: Potential Temporary Reduction in Shasta Project Water or Hydropower Supplied to the CVP and SWP Service Areas During Construction	LOS before Mitigation	NA	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Mitigation Measure Socio-14 (CP1–CP5): Secure Replacement Water or Hydropower During Project Construction.				
	LOS after Mitigation	NA	LTS	LTS	LTS	LTS	LTS
	LOS before Mitigation	NA	B	B	B	B	B
Impact Socio-15: Short-Term Increase in State Sales and Income Tax Revenues in the CVP and SWP Service Areas from Construction-Related Personal Income and Purchases	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
Impact Socio-16: Long-Term Increase in Agricultural Income and Jobs in the CVP and SWP Service Areas as a Result of Improved Water Availability and Reliability	LOS after Mitigation	NA	B	B	B	B	B
	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
Impact Socio-17: Reduction in Risk of Potential Water and Power Shortages (and Related Economic Activity) in the CVP and SWP Service Areas as a Result of Long-Term Improvements to Water and Power Supply Reliability	LOS before Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NA	B	B	B	B	B

Key:

B = beneficial
LOS = level of significance
LTS = less than significant
NA = not applicable
PS = potentially significant

No-Action Alternative

No mitigation measures are needed for this alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is needed for Impacts Socio-1 (CP1) through Socio-13 (CP1) and Impacts Socio-15 (CP1) through Socio-17 (CP1). Mitigation is provided below for the other impact of CP1.

Mitigation Measure Socio-14 (CP1): Secure Replacement Water or Hydropower During Project Construction To address potential temporary shortages in water or hydropower caused by reduced availability at Shasta Dam during construction, replacement water or hydropower supplies would need to be sourced elsewhere to maintain current service needs. Depending on the conditions of the water or energy markets at the time of need, these replacement resources could be more expensive than water or hydropower obtained from Shasta Dam. The additional expense of obtaining water or hydropower resources could potentially produce a minor negative effect on water and power customers if replacement of these resources is substantially more expensive.

To eliminate the potential impact of project construction on water and/or hydropower purchases, Reclamation will identify the need for replacement water or hydropower early in project implementation and will secure such resources at the lowest cost possible. Reclamation will provide these replacement resources to business and industry in the CVP and SWP service areas at costs comparable to water or hydropower obtained from Shasta Dam.

Implementation of this mitigation measure would reduce Impact Socio-14 (CP1) to a less than significant level.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is needed for Impacts Socio-1 (CP2) through Socio-13 (CP2) and Impacts Socio-15 (CP2) through Socio-17 (CP2). Mitigation is provided below for the other impact of CP2.

Mitigation Measure Socio-14 (CP2): Secure Replacement Water or Hydropower During Project Construction This mitigation measure is identical to Mitigation Measure Socio-14 (CP1). Implementation of this mitigation measure would reduce Impact Socio-14 (CP2) to a less than significant level.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply

No mitigation is needed for Impacts Socio-1 (CP3) through Socio-13 (CP3) and Impacts Socio-15 (CP3) through Socio-17 (CP3). Mitigation is provided below for the other impact of CP3.

Mitigation Measure Socio-14 (CP3): Secure Replacement Water or Hydropower During Project Construction This mitigation measure is identical to Mitigation Measure Socio-14 (CP1). Implementation of this mitigation measure would reduce Impact Socio-14 (CP3) to a less than significant level.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

No mitigation is needed for Impacts Socio-1 (CP4) through Socio-13 (CP4) and Impacts Socio-15 (CP4) through Socio-17 (CP4). Mitigation is provided below for the other impact of CP4.

Mitigation Measure Socio-14 (CP4): Secure Replacement Water or Hydropower During Project Construction This mitigation measure is identical to Mitigation Measure Socio-14 (CP1). Implementation of this mitigation measure would reduce Impact Socio-14 (CP4) to a less than significant level.

CP5 – 18.5-Foot Dam Raise, Combination Plan

No mitigation is needed for Impacts Socio-1 (CP5) through Socio-13 (CP5) and Impacts Socio-15 (CP5) through Socio-17 (CP5). Mitigation is provided below for the other impact of CP5.

Mitigation Measure Socio-14 (CP5): Secure Replacement Water or Hydropower During Project Construction This mitigation measure is identical to Mitigation Measure Socio-14 (CP1). Implementation of this mitigation measure would reduce Impact Socio-14 (CP5) to a less than significant level.

16.3.6 Cumulative Effects

Water reliability and electrical demand are expected to become increasingly important issues as demand for water and electricity increases to meet the needs of California's growing population. Over time, water conservation and reuse efforts will increase and water provision is expected to shift from such areas as agricultural production to urban uses. Environmental restoration, flood control, and hydropower generation are expected to continue in a manner similar to existing conditions.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Primary Study Area In the primary study area, effects related to increases in population and housing during construction under CP1 would be less than significant. In combination with past, present, and reasonably foreseeable future projects, this incremental contribution to increases in population and housing demand would not be significant. The combined effect of these projects and the SLWRI would not induce substantial growth in population, produce a substantial burden on the existing housing stock within the local community, or

require sizeable numbers of new workers from outside the local area. Implementing CP1 would result in beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

Extended Study Area Without mitigation, CP1 could cause a potentially significant adverse effect on business and industrial activity in the CVP and SWP service areas. This adverse effect would be a potential temporary reduction in Shasta project water or hydropower supplied to CVP and SWP service areas during construction. With implementation of Mitigation Measure Socio-14 (CP1), adverse effects from CP1 would be fully mitigated because Reclamation would secure replacement water or hydropower during project construction. Therefore, the project would not contribute to a cumulatively considerable incremental contribution to cumulative effects related to the temporary reduction in water or hydropower supplies to the CVP and SWP service areas.

Implementing CP1 would also result in beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Primary Study Area In the primary study area, effects related to increases in population and housing during construction under CP2 would be less than significant. In combination with past, present, and reasonably foreseeable future projects, this incremental contribution to increases in population and housing demand would not be significant. The combined effect of these projects and the SLWRI would not induce substantial growth in population, produce a substantial burden on the existing housing stock within the local community, or require sizeable numbers of new workers from outside the local area. Implementing CP2 would cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, the beneficial effects of CP2 in the primary study area would be greater than those of CP1. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

Extended Study Area The adverse effects of CP2 would be the same as those of CP1. With implementation of Mitigation Measure Socio-14 (CP2), adverse effects from CP2 would be fully mitigated because Reclamation would secure replacement water or hydropower during project construction. Therefore, the project would not contribute to a cumulatively considerable incremental contribution to cumulative effects related to the temporary reduction in water or hydropower supplies to the CVP and SWP service areas.

Implementing CP2 would result in less than significant effects on population and housing and also cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, the beneficial effects of CP2 in the extended study area would be greater than those of CP1. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply

Primary Study Area In the primary study area, effects related to increases in population and housing during construction under CP3 would be less than significant. In combination with past, present, and reasonably foreseeable future projects, this incremental contribution to increases in population and housing demand would not be significant. The combined effect of these projects and the SLWRI would not induce substantial growth in population, produce a substantial burden on the existing housing stock within the local community, or require sizeable numbers of new workers from outside the local area. CP3 would cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, the beneficial effects of CP3 in the primary study area would be greater than those of CP1 and CP2. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

Extended Study Area The adverse effects of CP3 would be the same as those of CP1. With implementation of Mitigation Measure Socio-14 (CP3), adverse effects from CP3 would be fully mitigated because Reclamation would secure replacement water or hydropower during project construction. Therefore, the project would not contribute to a cumulatively considerable incremental contribution to cumulative effects related to the temporary reduction in water or hydropower supplies to the CVP and SWP service areas.

Implementing CP3 would result in less than significant effects on population and housing and also cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, the beneficial effects of CP3 in the extended study area would be greater than those of CP1 and CP2. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

Primary Study Area In the primary study area, effects related to increases in population and housing during construction in CP4 would be less than significant. In combination with past, present, and reasonably foreseeable future projects, this incremental contribution to increases in population and housing demand would not be significant. The combined effect of these projects and the SLWRI would not induce substantial growth in population, produce a substantial burden on the existing housing stock within the local community, or

require sizeable numbers of new workers from outside the local area. CP4 would cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, in the primary study area, the beneficial effects of CP4 would be the same as those of CP3. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

Extended Study Area The adverse effects of CP4 would be the same as those of CP1. With implementation of Mitigation Measure Socio-14 (CP4), adverse effects from CP4 would be fully mitigated because Reclamation would secure replacement water or hydropower during project construction. Therefore, the project would not contribute to a cumulatively considerable incremental contribution to cumulative effects related to the temporary reduction in water or hydropower supplies to the CVP and SWP service areas.

Implementing CP4 would result in less than significant effects on population and housing and also cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. In the extended study area, the beneficial effects of CP4 for population and housing, employment, and the labor force would be the same as those of CP3. For business and industrial activity, CP4 would be more beneficial than CP3. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

CP5 – 18.5-Foot Dam Raise, Combination Plan

Primary Study Area In the primary study area, effects related to increases in population and housing during construction under CP5 would be less than significant. In combination with past, present, and reasonably foreseeable future projects, this incremental contribution to increases in population and housing demand would not be significant. The combined effect of these projects and the SLWRI would not induce substantial growth in population, produce a substantial burden on the existing housing stock within the local community, or require sizeable numbers of new workers from outside the local area. CP5 would cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, in the primary study area, the beneficial effects of CP5 would be the same as those of CP3. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

Extended Study Area The adverse effects of CP5 would be the same as those of CP1. With implementation of Mitigation Measure Socio-14 (CP5), adverse effects from CP5 would be fully mitigated because Reclamation would secure replacement water or hydropower during project construction. Therefore, the project would not contribute to a cumulatively considerable incremental contribution to cumulative effects related to the temporary reduction in water or hydropower supplies to the CVP and SWP service areas.

Implementing CP5 would result in less than significant effects on population and housing and also cause beneficial effects on employment and the labor force, business and industrial activity, and government and finance. Overall, in the extended study area, the beneficial effects of CP3 would be the same as those of CP3. Thus, the project would not result in a cumulatively considerable incremental contribution to cumulative effects on socioeconomic resources.

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